YACHTING

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"The brilliant indigo sea shoulders itself up against the sky"

Initiation

A Long Experience in Coastwise Cruising is Crowned by a Deep-Sea Voyage

By VINCENT GILPIN

THE December dusk was falling over the sand dunes, and the last gulls were leaving their foraging grounds with plaintive whimperings as we slipped past the gray old town of Beaufort toward the inlet, under tow. Some of us shook out the canvas while the skipper warmed up the little Diesel; the night was fine but chilly, the wind fair but very light. We were on board *Alice*, sturdy 52-foot centerboard ketch, owned and commanded by Henry Howard, and manned by three friends, one sailor and a cook.

As we swung south into the channel we overhauled a little yawl, also outward bound, and I had an indescribable thrill; she was bound down the coast to Florida, while we were for St. Thomas direct — a probable fortnight at sea. My years of coastwise cruising with its varied piloting experience were to be crowned by real navigation; instead of dodging from port to port as weather permitted, we were thrusting out into the bosom of the Atlantic, prepared for what might come. Dead reckoning was to be secondary to chronometer and sextant, and henceforth I could call myself a voyager.

At the sea buoy our tow line was dropped with a shout of farewell, and the engine took up its duties, driving us almost as fast as the following breeze, so that the canvas was scarcely filled. How still and clear it was! The twinkling lamps of Beaufort were already low on the horizon; Cape Lookout lighthouse was the only other mark of man, with the sky a great sweep of star-spangled dark. We streamed the log, marked the time, and so took departure for the West Indies.

The course was southeast, straight offshore, to cross the Gulf Stream as quickly as possible. Off Cape Lookout this great current is as narrow and as close to shore as anywhere north of the Florida Straits, and the tangled air currents resulting from its warmth make a barrier to the winter storms of the North Atlantic, most of which never get past it to the eastward. Once clear of it, we would head a bit more eastward, through a belt in which we might expect light variable winds, so that by the time we reached the edge of the great northeast trade we should be far enough east to make it a fair wind to St. Thomas.

We made up three watches, so that each had four hours on duty followed by eight hours off — a most luxurious scheme, since few of us unused to broken nights can get the full benefit of a four-hour watch below.

Thus we dropped Cape Lookout, raised and passed the lightship, and when I came up at midnight we were in the Gulf Stream, and the winter was gone! The water stood at 78° and the penetrating chill was gone from the air. Never were happier conditions to cross the Stream. There was breeze enough, still aft, to warrant shutting off the power, and we finished the night under the restful silence of the sails, slipping through the little waves with a rustle at the bow, a murmur alongside, and a sharp tinkle of salt bubbles in the wake. The following

breeze eddied gently past, and we could almost believe ourselves in the tropics. And it was good to look on the open sky — the free sweep of all-outdoors — for it was a long time since I had seen the clean ring of the horizon. How thrilling to think that the next break in it would be a tropic island!

Kind as the Stream was to us, it could not altogether lose the characteristic choppy confusion of the eddies at its edge, and two of the ship's company succumbed. The cook was worst — an ill omen, surely, but the good man was a hero, and though never happy in rough water and often acutely wretched, he served three good hot meals, plus morning coffee and afternoon tea, every day of our cruise! An achievement, you will admit.

At four o'clock we sleepily called the watch, read the log, made our entries, and turned in — and be sure those bunks were good!

All morning of the second day we were in the heart of the Stream with beautiful weather. We might have asked more wind — the mild air, dead aft, did nothing to steady the boat, and the swell, though slight, kept its Gulf Stream chop; it wobbled and twisted and wriggled, and the unsettled interiors remained restive. But the color — that marvelous crystal indigo, into which the sun struck deep shafts of blue flame, lighting to emerald and jade in the crests of the waves — there is nothing like it in our cold gray North Atlantic. The water was 78° still, the air mild and balmy. What a chance for the crew to shake down in comfort!

Day broke quiet and lovely over the "Alice"

First came life-lines. It is a lot easier to slip overboard at sea than to get back again, and we had no intention of trying any experiments, so two parts of light halliard stuff were stretched from the bronze-cable guard rail on the cabin forward to the cutwater and aft to the taffrail.

Then the sextants were limbered up. The owner was navigator as well as skipper and engineer, but I kept my own reckoning as a check. We used Weems' method, which demands only common sense and arithmetic, and we eliminated the watch and worked direct from the chronometer, one being stationed at the foot of the companion to note times and angles as called by the other on deck. When a satisfactory series of sights was secured we exchanged, repeated, and then worked both sets independently.

With all care it was interesting and a little disconcerting to find that mistakes easily crept in, and we formed the habit of checking each other's work; even addition and subtraction have new chances of error when applied to unfamiliar units. With a little practice most of this disappeared, and our results pretty generally coincided, sometimes with gratifying accuracy; more could not be asked on a 50-foot boat, where the height of the sea running at the moment is an important element.

Those first smooth days we had a good horizon all the time and could take the sights as they came, trusting to the series to eliminate the slight rise and fall of the boat. But when the crests of the seas showed against the sky as we stood on the cabin, we could get a sharp horizon only by waiting until the boat lifted to the top of a wave. In figuring a series of such sights, the height of eye must be increased by the height of the waves above mean sea level, or about half their height, trough to crest, as usually measured.

This factor is rich in chances for error. It is undoubtedly the chief reason why accurate navigation of a small boat is difficult, and I do not think it is sufficiently emphasized in articles on yacht navigation. To know when you are actually on top of a wave, and to get your sight at that moment, are sufficiently hard. You must then estimate the height of an average (not extreme) wave, divide by two, and add the result to the height of your eye above the boat's water line. We tried to get accurate contact between sun and horizon and at the same time average the height of the waves by watching through a series of them for each reading, sometimes with a third person to call the moments when we were on the crests.

It sounds more complicated than it seemed at the time, though I must admit that a disproportionate number of hours were spent on the job! We added a noon latitude sight to the usual morning and afternoon ones; we had a lot of cloudy weather in which it was a tedious job to get any sights at all, and finally we were determined on the greatest possible accuracy day by day to ensure the best basis for dead reckoning in case of prolonged bad weather; our landfall would be among islands not well marked, and surrounded by dubious currents and dangerous coral reefs.

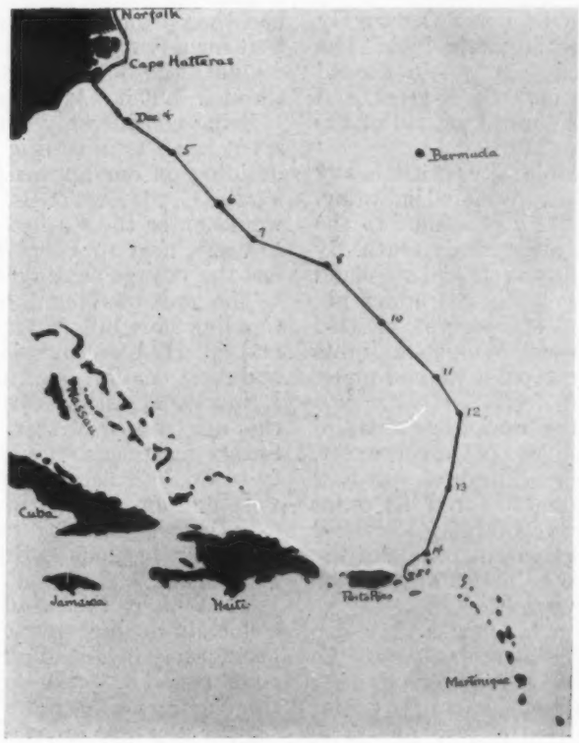
By noon that first day we were on the eastern edge of the Stream; the water was down to 76°, and thereafter fell only one degree more, for on our route there was no cold water east of the Stream. Behind us that afternoon far-drawn masses of low, pearly cumulus, the "Gulf-Stream clouds," lay fairy-like along the horizon. They were familiar off the Florida coast, but it was strangely up-side-down to see them in the west.

That night the middle watch was a dead calm — and what a night! The blue-black vault of heaven blazed with millions of diamonds, twinkling and flashing as though in the light of flickering candles, while every now and then the white flame of a meteor seared its lingering scar across space.

There were occasional ghostly stirrings of air, but nothing to make steerageway, and after an hour or two of futile attempts to keep on our course I lashed the tiller and devoted myself to the job of keeping awake. For some reason the bow of the boat seemed drawn irresistibly northward; whatever vagrant puff gave her the slightest swing always pulled her in that direction, and once headed for the pole-star, there she hung, as steadily as the needle of the compass. This continued throughout the night, and I am inclined to think there must have been some actual polarity in her hull — or else she objected to our southern destination!

The day broke quiet and lovely, with a light southerly air. We were well out of the Stream; the sea was quite regular, and decreasing steadily; the sun shone, the air was warm, and all invalids came up smiling. Heavy cumulus clouds in the direction of Hatteras showed a few flashes of lightning, and there were fine-combed wind clouds over them which suggested a winter gale raging on Pamlico, while we, two hundred miles out from Beaufort, sat in the wind in shirt-sleeves, on a sea as quiet as the gentlest heart could wish. It seemed incredible that we were really at sea, it was so much more comfortable than our wet and freezing days on Pamlico Sound, and we were mightily enthusiastic about winter cruising in the Atlantic. It was a lonely sea, however — nothing was sighted all day.

After another calm night, about five in the morning of our third day out, a brisk squall appeared in the northwest, the mizzen was stowed, and all made snug. The wind finally came out fresh northeast, giving us a good six knots under moderate sail. This was heartening progress, and the wind continued so steadily into the day that it suggested the trades, though we were three hundred miles north of their normal limit. At length it hauled to about east-northeast, and we spent the day close-hauled on the port tack, with the Diesel boosting us along grandly. Even a small auxiliary is a surprising help on the wind, especially in a sea, and it was choppy this morning, with yesterday's northwest rollers continuing under the rising northeast swell.



"Alice's" track from Beaufort to St. Thomas

The sea was bare and empty, without a glimpse of smoke or canvas — a poor place to await rescue! There were no fish in the water, and only two birds in the air; one supremely delicate and graceful tropic-bird briefly inspected us and went his way, and later a great blue heron laboriously floundered up against the puffy wind in hope of finding a resting place. We were three hundred miles from the nearest land, so he was certainly out of his bailiwick, and must have been tired, but he dared not perch, and wheeled wearily off toward the coast, stooping to a heavy bunch of gulf-weed where he no doubt picked up a small fish or two by way of light refreshment.

The breeze was fresh and variable toward night, and we turned two reefs in the mainsail for both comfort and safety during the night, which gave us fair progress. The fourth day opened with a fresh, steady northeaster which pushed us gaily along all morning and renewed the talk of "trade-wind." Alas, it hauled several points about noon, and for some time we could head no better than south on the port tack; then it went to south, and we came about, heading east-southeast, and centering our hopes on a further shift to the westward. All in all, it was a somewhat depressing day of little progress.

All that night the wind hung south, even backing a little, but easting was now our chief object, and we stuck to the starboard tack, heading about east by south, or a little better. The skipper decided to keep the power on, though he had to be called every two hours to oil and inspect.

So it continued on the fifth day, hauling a bit so that we could just start our sheets, but refusing to swing west. The engine could be stopped, however, and it was good to travel under sail alone. The sea was a bit high and messy from the various shifts of wind, and it managed to deprive me of my breakfast, though I felt quite well before, during and after the humiliating incident! Seasickness is a puzzling business; at all events I was now "salted down."

It was a fine day, of pretty good progress, but roughish, and we all wanted a smooth sea and fair wind, for a change and for better speed. By this time the hatch covers and companion spray hoods had been well tested and proved invaluable. There had been many rain squalls and a fairly constant sluicing down with spray all over the boat — the rash soul who stood his watch without oilers got soaked sooner or later — but not a drop had found its way into the cabin. At the same time the slides could stand open under the hoods, ensuring excellent ventilation.

Unfortunately, nothing could be devised to perform this service for the forecastle. The booby hatch was sealed tight in its canvas cover, and the men's quarters were dark and stuffy. It was, as usual, impossible to make the chain pipe thoroughly tight, and a slight dribble there kept everything damp below. As the fore hatch had been in a bath of heavy spray so far, and the whole head of the little ship resounded with the crash and sluice of waves, it was really no place to sleep.

One of the thrills today was "turning on the clock." Starting on 75th meridian time, we were now past 68° and the cabin clock was half an hour slow of the sun, so we ceremoniously pushed it forward thirty minutes, and felt our progress tangibly marked.

The wind freshened at nightfall and we made good time. About midnight we sighted our first ship since the coast — a steamer, dead ahead, which for some time continued heading exactly for us. This was just the chance we would have welcomed by daylight, to signal our name for report to the newspapers, and so to the families, but we carried no means of identification at night. At last she worked off on our starboard bow and passed a quarter-mile or more away, headed nearly west, perhaps for Savannah.

Many showers came with the puffs that night, and on the morning of the sixth day I found the dinghy full of water up to the thwarts, and in the water, swashing violently fore and aft as the yacht pitched, the most remarkable pot-pourri I have ever seen. For lack

of room below, and also for coolness, the fresh vegetables had been stored in the little boat, and the trouble commenced with a big paper carton of onions, which melted in the rain. Its fibres, together with frayed manila, bits of onion and other stuff, solidly choked the ball check in the bilge drain, and the rain and spray soon accumulated. Then the onions searched out every nook and corner among the other contents of the dinghy with a pertinacity worthy of a better cause. They were huddled between the turns in all the coils of rope, packed tight among the stops in the water glass and jammed beneath the clamps and floor boards; all were peeled, and many smashed and mixed inextricably with paper pulp, rope yarn and excelsior. The same thing had happened to the cabbage, of which only a few heads remained. The corned beef was thoroughly soaked, and had a pallid, unenthusiastic look. The carrots had followed the onions. The whole needed nothing but a fire beneath to make one great and glorious Irish stew, and it took hours to get rid of the water and restore some semblance of order.

It was a rough and disagreeable day, with heavy clouds, frequent deluges of rain, and occasional lightning. Each squall suggested the possibility of a shift to the northwest, but for a long while it hung nearly south. By mid-afternoon it got as far as southwest, and we could make good progress about south-southeast, under jib, double-reefed mainsail and engine, and we were all glad the time had come to get southward. We got no sights all day — our only "blind" day, though we had many almost without sun.

From six to eight that evening we had a series of terrific rain squalls, roaring deluges of warm water, which once more filled the dinghy. The beef was now very "high," and it had colored and flavored the water most unattractively. A big box of vegetables had surged to and fro until it knocked a section out of one of the dinghy's frames, and then broke to pieces against the thwarts. Again I rescued what was left.

It was a gloomy night, and rough. Once a white-cap lipped over the rail and filled the little cockpit to the brim — startling but harmless. It cleared quickly through the ample scuppers, and the warm sea water seemed scarcely as wet as the rain. There was some trouble seeing the compass, which was mounted in the cockpit floor with a small electric lamp above it; the under side of the glass sometimes misted over, leaving the markings hopelessly vague, but we found that a little spot above the light-bulb remained clear, and learned to concentrate on that.

The seventh day opened about dawn with a call for all hands — the main sheet had parted company with the boom, and the sail was out of control. We all rushed up to find the boom against the backstay, lifting away with every roll and surging heavily against it. The sheet rove through a four-sheave block shackled to a revolving ring on the end of the boom, as required by the roller reefing-gear, and the same shackle carried the heavy manila boom guy as well as the after end of the "foot rope" which held the lazy-jacks in place. Under the combined load the shackle had opened and twisted, but fortunately the pin was still sticking in it. We soon got a line around the boom, and in a few minutes the skipper skilfully straightened the shackle in the heavy engine-room vise. Good equipment pays at sea!

The day continued squally, but gave us a laying breeze and fair progress under sail alone. The navigators had their troubles, as only a misty sun appeared, and that for a few moments at a time; we hovered over the sextants and did our best to catch him when he peeped through, but it was harassing guess-work at the best.

Being considerably over halfway to St. Thomas, we spent some time sorting out charts of the Virgins and deciding on our approach. For our landfall we picked Virgin Gorda, which is high and prominent, and we would enter the Caribbean by the well lighted Virgin Passage, next to Porto Rico. It was quite exciting to feel the voyage nearing its end.

The sea was high, but regular and easy — great toppling blue hills running down out of the northeast and quietly boosting us on our way. This was the best and most comfortable run so far, and we all enjoyed it. It was deliciously warm; blankets were stowed beneath the mattresses, winter clothing was discarded, and fingers no longer stiffened on the tiller, even in wind and rain. Our heroic cook was quite cheered up. There were no more crashes in the galley, and he made some extra good cakes for tea, while dinner time brought especially luscious odors wafting alluringly out from his domain.

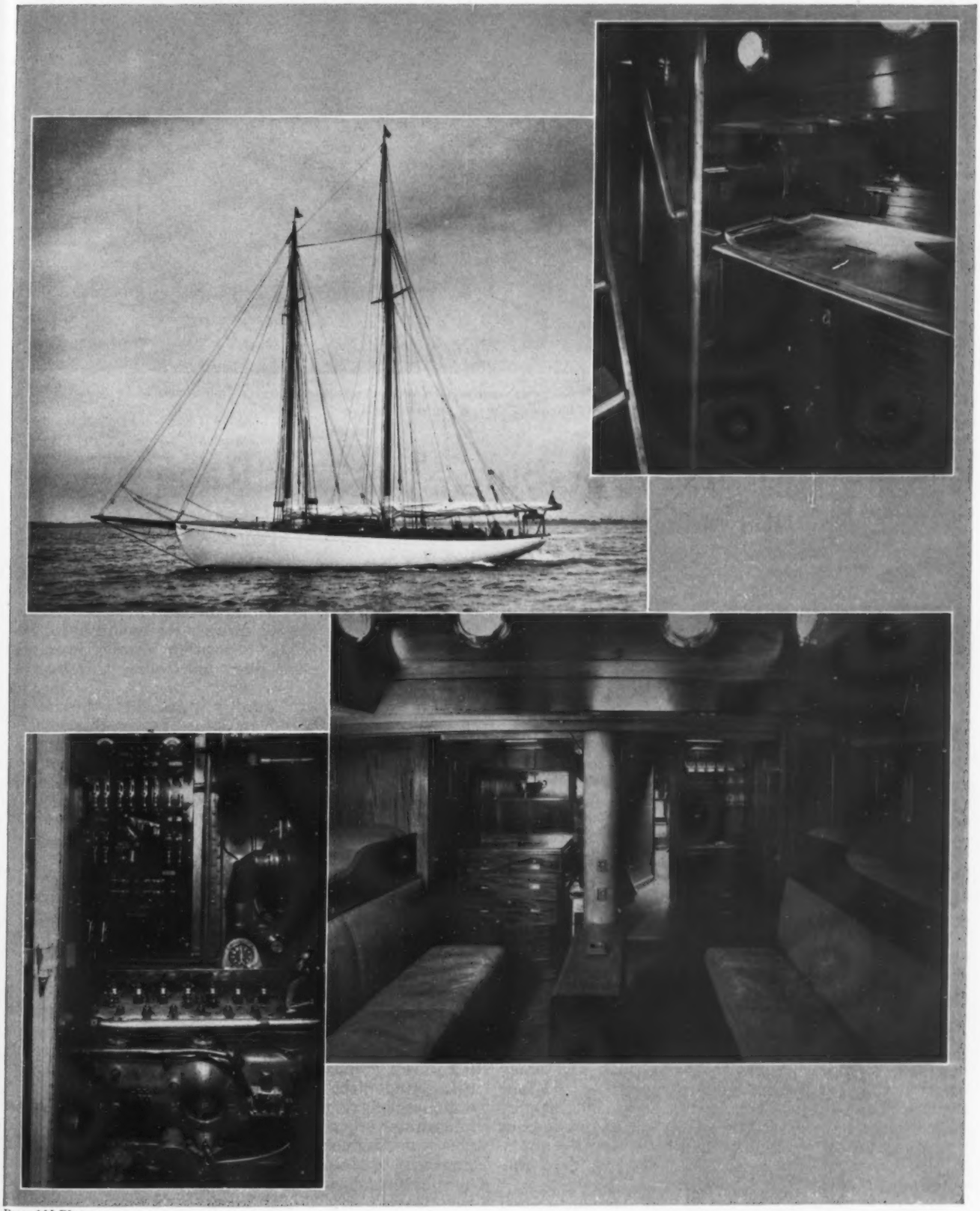
That night the wind gradually died until at two o'clock in the morning of the eighth day we were rolling insufferably in a dead calm. Finally, for the sake of both comfort and progress, the skipper turned out and started the engine, and it ran all through the somewhat spectacular day that followed. It was just a long succession of vicious rain squalls, with calms or mild airs between, and extremely lovely cloud pictures. It was another all-day job to get sights, but we just managed it.

About four that afternoon a very heavy squall struck in with torrents of rain and increasing gusts of wind. We all turned out in a hurry, got the jib off her, rolled two reefs in the mainsail, and away we shot for St. Thomas,

(*Continued on page 96*)

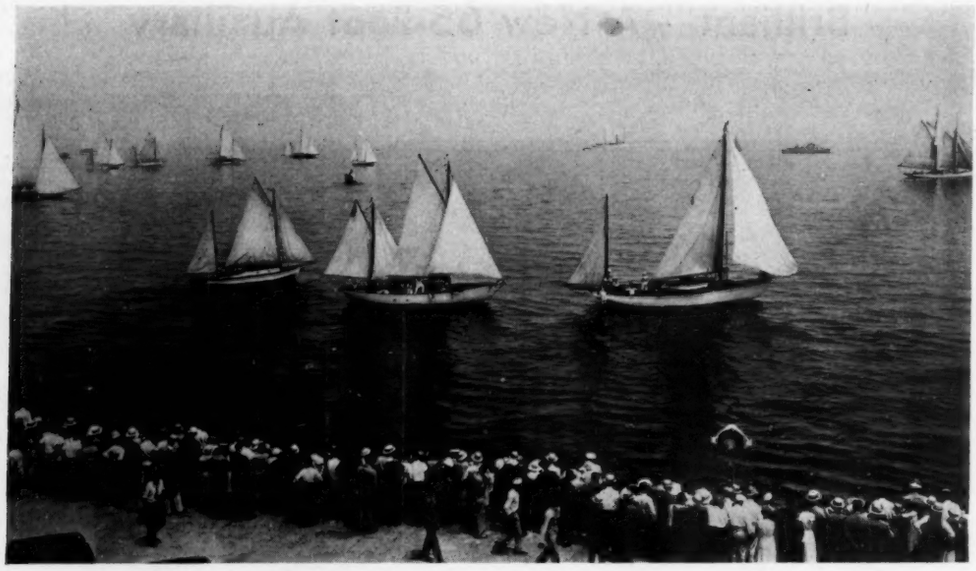
St. Thomas, one of the loveliest of harbors

"Brilliant"—A New 65-Foot Auxiliary



Rosenfeld Photos

"Brilliant" is one of the new yachts launched this Spring and she is now being tuned up in anticipation of the Bermuda Race, in which she will be a starter. She is owned by Walter Barnum, of New York, and is from designs by Sparkman & Stephens. "Brilliant" is 65 feet long over all and carries the conventional gaff rig. Below decks she is carefully thought out, the joiner work and finish being unusually attractive. The pictures show the main cabin, chart room, and engine room, with its Kermath 4-cylinder motor. The yacht was built by H. B. Nevins, Inc.



The start of the St. Petersburg–Habana Race was made under drooping canvas and burgees. "Chippewa" leading "Cynosure" across the starting line

The St. Petersburg–Habana Race

Nine Yachts, in Two Classes, Sail Third Annual Event

By GIDGE GANDY

FOR any blue water racing man pining for the spice of variety, we prescribe a dose of St. Petersburg-Habana Race, to be taken immediately after St. Petersburg hospitality and before a treatment of Cuban hospitality, as administered at Habana!

Skippers who have sailed three of the races from Tampa Bay to Morro Castle will bear witness that the winds and waters west of Florida and north of Cuba are capable of at least three distinct, unrelated varieties of sailing conditions, in which any ship has a sporting chance at attractive silverware, provided her skipper and crew attend to their knitting and play for luck in the breaks.

In this annual event no yacht has finished first upon more than one occasion, only one craft has been first to finish with a foreknowledge that she was in the lead, and but one yacht has ever taken first place in her class more than once. Meteorologic and hydrographic averages to the contrary, the breezes and currents to be encountered upon this course, and the results of the race, are unpredictable.

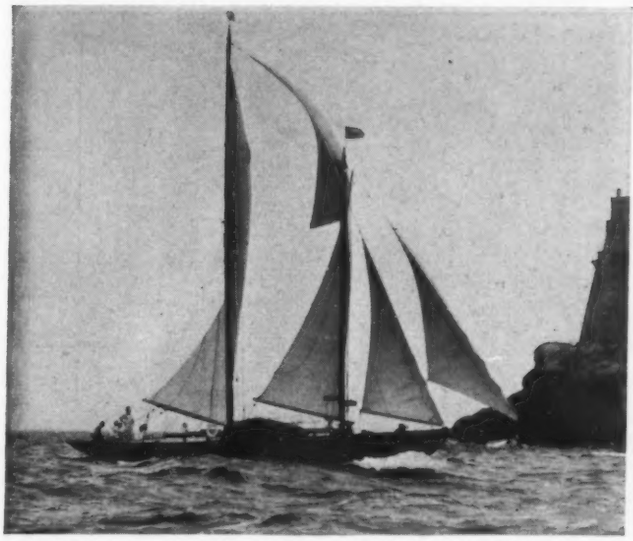
In the first race, 1930, a norther on the Gulf, a fresh Trade wind over the Stream, and normal currents gave the fleet a quick passage and lucky landfalls. In 1931, however, a westerly gale, breaking seas and crazy current irregularities scattered the craft to the four corners of the Western Hemisphere — to the great joy of press correspondents! The 1932 affair contrasted our previous jaunts to the land of the Rhumba with a wholesale collection of light airs, calms, head winds, variegated luck and far-flung landfalls.

Imagine a fleet of nine racing craft spreading their courses across two degrees of longitude and consuming from 99 to 126 hours to sail a southerly course of but 284 miles! Picture, if you will, a little white schooner leading that fleet for nearly four days, only to encounter baffling airs and calm within 20 miles of the finish line; while her most dangerous rival, after having been becalmed for seven hours at a position 70 miles from the finish, gracefully comes down the course to take the gun of victory!

On the morning of Saturday, April 16th, the day of the start, a fresh breeze blew across Tampa Bay to confirm the published weather report, "Northeast and east winds, moderate to fresh." About the yacht basin at St. Petersburg, completing preparations for the one o'clock start, skippers, sea cooks and foremast hands smiled at the thought of a good breeze abaft the beam, dry bunks, warm food and the promise of a Daiquiri or two before Monday's evening meal.

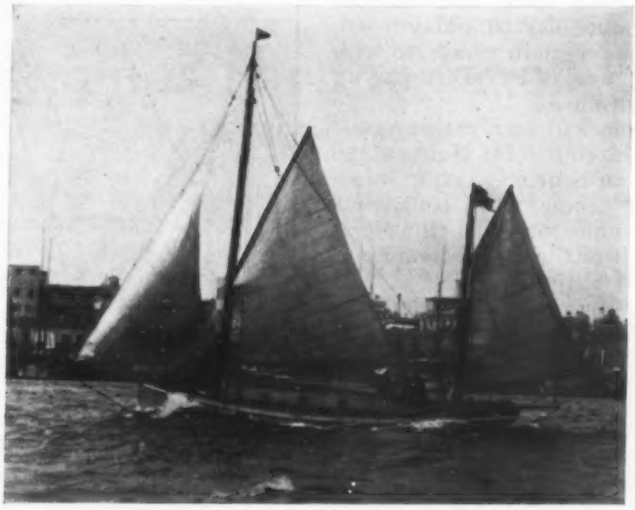
But before noontime our optimism died with the breeze and motors were required to propel the entrants to the starting line off St. Petersburg's recreation pier, where thousands of spectators awaited to see "the boats which are sailing all the way to Cuba, would you believe it?" With an occasional breath from the east, the fleet, under lowers, with light canvas in stops, was scarcely able to stem the incoming tide and hold to the line.

Four schooners, two ketches and three yawls, ranging in size from 65 feet over all down to 30 feet were there, under the drooping burgees of seven yachting organizations and all carrying the Tampa Bay Cruising Squadron burgee at main spreaders. The largest of the fleet was Commodore H. S. Denniston's husky schooner *Sunshine*, of Mobile, winner, last season, of the Machado Trophy for Class A and the Bacardi Cup. Next in size was Garner H. Tullis' black centerboard schooner *Windjammer*, 1930 winner in the class. The third entry in Class A, Commodore Houston Wall's schooner *Haligonian*, of Tampa, had outsailed the entire fleet in 1930.



"Windjammer," winner in Class A, slipping past the Morro at the end of the long race

Sailing in Class B for the YACHTING Trophy were two contestants new to this race, Dr. Alexander C. Howe's *Lanakai*, of Brooklyn, and C. G. Borden's yawl *Chippewa*, of Falmouth. *Chippewa's* owner and skipper, a young man of 76 years, was 90 percent of her crew, if experience alone is considered. St. Petersburg was represented in Class B by *Cynosure* and by F. G. Wagner's yawl *Pieces of Eight*. Kent Curtis' yawl *Marelen II* was at the line, and the toy ketch *Game Cock*, owned by William B. Allen and the smallest entry in the race, completed the list.



"Marelen II" took first place in Class B, winning the "Yachting" Trophy

With the crack of the gun at 1:00 P.M., light sails were broken out and the fleet stood, crawled or crept across the line with just sufficient easterly air to hold steerageway. Aboard *Cynosure*, we employed a little "local knowledge," starting at the leeward end of the line and shaving the pier in order to avoid the strength of the current. Expecting something from the southwest, we kept our eyes in that direction until we caught sight of the flutter of a flag and the sudden movement of a smoke-drift over the town.

"Down light sails!" was the order. *Cynosure*, close-hauled, squared away on the starboard tack and, while ballooners of the fleet were taken aback, she stepped out ahead of the fleet, for the first and last time. But on those other eight decks were many smart sail handlers and it was but a few minutes before the black hull of *Windjammer* passed through our lee and the other Marconi-rigged craft proved again the old story that a gaff-headed ketch simply will not point close to the wind.

From St. Petersburg to the turning buoy in the Gulf, just off Southwest Pass, it was windward work with the starboard tack just a bit longer than the port. The larger yachts gradually forged ahead in the lower bay, where they had sufficient sea room.

Haligonian led the fleet out of the pass, closely followed by *Windjammer*, with *Sunshine* some distance astern. *Lanakai*, which had used her balloon staysail to windward, was next in order, followed by *Pieces of Eight*. *Marelen II*, *Game Cock* and *Cynosure* rounded the Southwest Pass buoy together in the dark at 9:30 P.M., with *Chippewa* somewhere behind us, handicapped by her small sail plan. Here the breeze hauled to N. N. W. and during the night steadily weakened, giving us much practice with light sails. By midnight, the breeze had gone to N. E., softening all the while. By a system of flashlight distinguishing signals, we kept in touch with our convoy, the famous old C. G. Cutter *Tuscarora*, under command of our friend, Lieut. Comm. Grogan, who nursed the race fleet all the way to the Cuban Coast.

Sunday morning was one of easterly airs which gave us little more than steerageway and the afternoon was a long period of flat calm when the bows of all yachts in sight headed to one point of the compass or another. *Pieces of Eight* was ahead of us, almost due south of our position. *Sunshine* and *Marelen II* were abeam in the east, *Lanakai* and *Game Cock* on our starboard bow in the southwest, the latter almost at the horizon. *Haligonian* and *Windjammer*, with their tall Marconi mainsails, had ghosted down over the southern rim of the world, but *Chippewa* had not shown up over the northern horizon.

After sundown Sunday evening a gentle breeze came to us from the south and slight progress was made, but at 7:00 A.M. Monday *Cynosure* was but 47 miles from the starting line — after 42 hours of sailing! During Monday and Tuesday, however, we

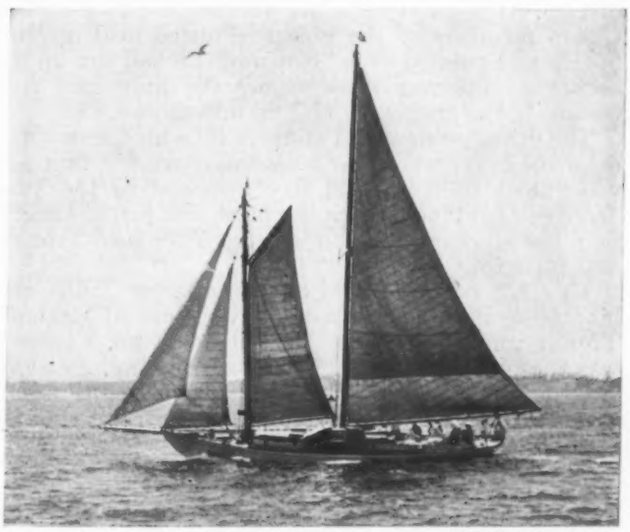


Photo by Porter Varney

"Haligonian" led the fleet to within 20 miles of Habana, only to lose the wind and fetch up to the eastward of the finish

held better breezes from the southerly quadrants and the fleet separated as we tacked down the Gulf.

Desiring to sail off soundings to the westward of Dry Tortugas in expectation of favorable currents near the head of the Gulf Stream, and hoping to avoid the northerly set which might be encountered in the neighborhood of the Florida Reefs, we worked *Cynosure* offshore and early Tuesday evening sighted the flare of Hog Island Light (Dry Tortugas) against a squall cloud in the east. Shortly we sighted a sail and the lights of what proved to be *Marelen II*. She was east of *Cynosure* and disappeared on the starboard tack, while we sailed on the port tack several hours into the southwest beyond the hundred-fathom curve.

At midnight we came about and encountered a belt of squalls which presented us with a few handfuls of wind and rain. We continued upon the starboard tack all the way across the Stream to the Cuban coast, the breeze freshening and hauling to S.W. and finally to W. as we approached the coast in the late afternoon.

Several hours before we sighted Hog Island Light *Windjammer* sailed into an area of baffling airs and calm, far down to the southwest in Latitude 23° 50′ and Longitude 83° 30′. She hove-to for seven hours, while skipper and crew slept. In the early hours of Wednesday morning, she caught the southwest breeze in which we were then sailing in a position southwest of Dry Tortugas, up in Latitude 24° 23′ and Longitude 83° 15′.

In the meantime, *Haligonian* had been making good progress upon a fairly straight course for Habana and she continued to do so until an hour or so after *Windjammer* caught the southwest breeze, when *Haligonian* encountered a soft spot 20 miles or so northwest of Habana, right in the strength of the Gulf Stream current, which carried her off her course.

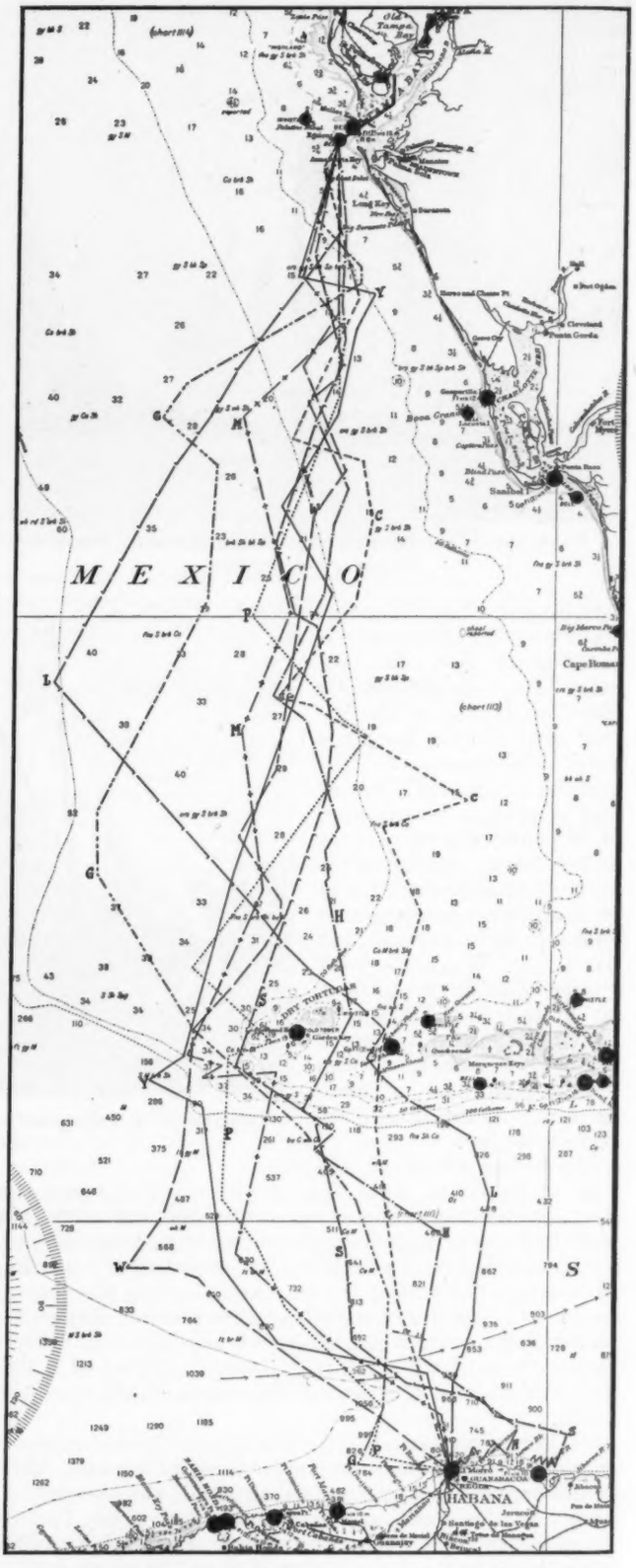
As we crabbed in toward Morro Castle, we sighted a white schooner under the headlands east of Habana, beating up to port against that wicked current. We expressed admiration for the windward qualities of Cuban fishermen, until a shipmate cried, "*That* mainsail belongs to no smack!" And another whispered in surprise, "*Haligonian!*"

We beat her to the harbor entrance, puzzled as to why she could have made the fatal mistake of getting to eastward of the port, never surmising that a calm existed, for we had carried a good breeze all the way across the Stream. At Morro Castle, we were again puzzled when Cuban members of the race committee held up two fingers and pointed at us. Not until we had run up the harbor to discover *Windjammer* the only race contestant in the anchorage, did we understand.

The drink we took had no more than hit the spot and done its duty, when our luck failed us, for that sail which had trailed us all day belonged to the yawl *Marelen II*, which crossed the finish line just in time to save her allowance and to win the YACHTING Trophy, first prize for Class "B."

That top notch winner, or loser, Garner Tullis, and his famous *Windjammer* received the General Machado Trophy and the Tourist Commission Cup. *Cynosure* was the proud recipient of the Bacardi Cup. *Sunshine* shared *Haligonian's* fate and was carried to the eastward, while *Game Cock* and *Pieces of Eight* lost time by making poor landfalls to the westward.

The summary:



Track chart of the fleet: C, "Chippewa"; G, "Game Cock"; H, "Haligonian"; L, "Lanakai"; M, "Marelen II"; P, "Pieces of Eight"; S, "Sunshine"; W, "Windjammer"; Y, "Cynosure"

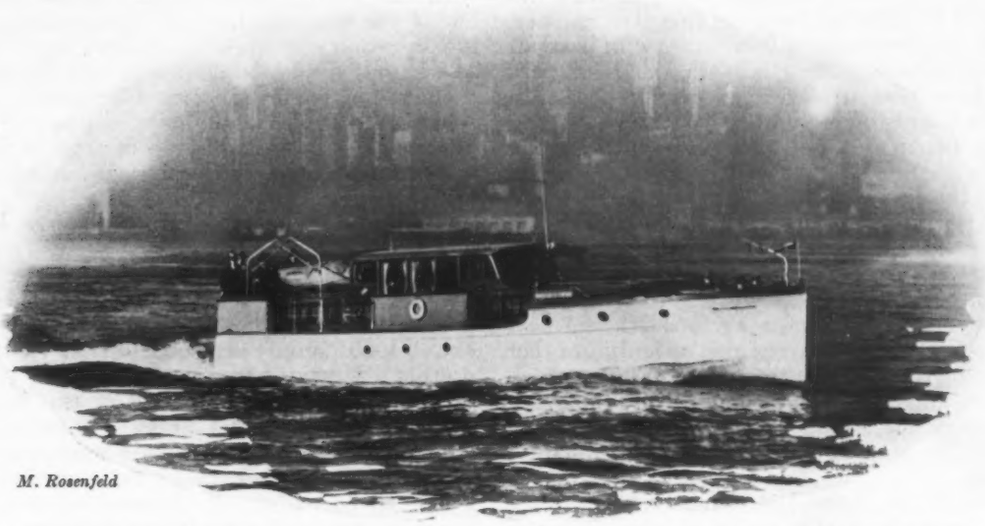
CLASS A

	O.A.	Rating	Time	Allowance	Corr. Time
Windjammer	57′ 2½″	51′ 5¾″	99–05–25	1–00–00	98–05–25
Haligonian	45′ 8″	41′ 1¼″	102–28–15	2–00–00	100–28–15
Sunshine	64′ 1½″	57′ 8¾″	(110–15–17)	x–xx–xx	(dropped out)

(Note: Arbitrary time allowance of one and two hours adopted at meetings of captains of Class "A" yachts, prior to race start)

CLASS B

	O.A.	Rating	Time	Allowance	Corr. Time
Marelen II	31′ 7″	28′ 5″	102–50–00	4–30–15	98–19–45
Cynosure	36′ 8″	33′ 0″	101–52–30	2–35–43	99–16–47
Game Cock	30′ 0¼″	27′ 0¼″	105–07–05	5–05–12	100–01–53
Pieces of Eight	32′ 4½″	29′ 0½″	104–36–35	4–12–25	100–34–10
Lanakai	43′ 0″	38′ 8½″	105–52–30	0–12–34	105–38–26
Chippewa	43′ 7″	39′ 2¾″	126–20–00	x–xx–xx	126–20–00

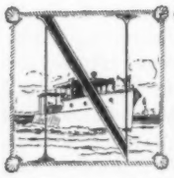


M. Rosenfeld

The Diesel motor is rapidly finding its way into the smaller cruisers. Here is a 50-foot Wheeler with a new 100 h.p. light weight Winton that will do better than 12 m.p.h.

Diesel Engines For the Small Cruiser?

By GEORGE F. CROUCH



NO OTHER type of motive power has so caught the fancy of the general public or received such an overwhelming amount of favorable publicity during the past five or six years as has the Diesel engine. And this is true not only for the public but also for the technical engineers who are designing and building internal combustion motors. The technical papers of the engineering societies are filled with carefully prepared articles about Diesel motors.

Why this should be the case is not hard to explain. A simple statement of the advantages of the Diesel principle without telling anything about the disadvantages which are inseparable from the operation of any high-temperature, high-pressure device sounds as if it were taken from the pages of one of Jules Verne's stories. Not only to the layman but to the engineer as well, any motor which dispenses entirely with the carburetor and ignition systems and all that they involve, which has no spark plugs, no timer, no distributor, which has no need for any preheating device and which can actually burn anything in the line of oil from light distillate to crank-case drainings and which completely eliminates the hazard of volatile gasoline aboard a boat, seems too good to be true.

But these are no more than fair statements about the good features of the Diesel motor. There are still more. It turns more of the energy of the fuel into useful work than any other form of prime mover. Taken in conjunction with the low cost of the fuel which can be used in the Diesel, it means that the cost for fuel is decidedly less than for any other form of engine. When a boat is used every day for commercial purposes this is a factor of the utmost importance and every modern ship, whether large or small, is almost forced to use a Diesel installation. After hearing all this about the Diesel motor it is no wonder that the motor boat owner says, "My next boat must have a Diesel motor."

If the boat is a large one and the power is around 150 h.p. and over, there is no question about the success of the installation, but in the smaller sizes there seems to be less unanimity of opinion regarding the probable success of the Diesel type.

An elementary discussion of the Diesel cycle will show clearly why this is true and will also show what is being done in the modern small Diesel to overcome the objections against the use of the earlier forms. Whether the motor is of a thousand horsepower or only forty or fifty, the principle is identical. Only in the actual details do they differ. And contrary to what is true regarding the gasoline motor, the small Diesel has more problems to solve than the large one.

Diesel motors are built in both two- and four-cycle types but the four-cycle is the one more commonly met with in moderate powers. It has an inlet and an exhaust valve just as has a gasoline motor, but on the suction stroke, only air is drawn into the cylinder through this inlet valve. There is no carburetor and nothing to correspond to one. In most cases there is no manifold, as the air is drawn directly into each cylinder through a silencer which deadens the suction noise. After the piston reaches the bottom of its stroke, this inlet valve closes and the air in the cylinder is compressed by the upward motion of the piston. Compressing any gas such as air, or a mixture of gases like that drawn into the cylinder of a gasoline motor from the carburetor, causes its temperature to rise. The higher the pressure to which it is compressed the higher the temperature produced.

This limits the possible compression in a gasoline motor to a temperature below that at which the mixture would explode, but in the Diesel motor the compression is carried to about 450 pounds per square inch, since air, and air alone, is compressed and not an explosive mixture. This heats the air until it has a temperature of more than a thousand degrees and then, when the piston is almost up at the top of its stroke, a very finely divided

mist of fuel oil is sprayed through a nozzle into the intensely heated air. The oil burns as it enters, causing a slight rise in temperature and an increase of a small amount in the pressure which is maintained for part of the succeeding down stroke. The injection of the oil is stopped after the piston has descended part of the way on its working stroke and then the gases which are the products of the combustion continue to force the piston down through the rest of the stroke. The exhaust valve opens a little before the bottom of the stroke, and the gas, which is greatly reduced in pressure and temperature, is exhausted on the succeeding up-stroke, exactly as in any gasoline motor, and the cycle is then repeated.

This is the Diesel cycle — a cycle of the utmost simplicity. No mixtures, no explosions, no ignition other than the heat of the air. Nothing but a simple engine with two valves and a spray of oil coming into the cylinder at the proper time, in the proper amount, and properly subdivided so that it will burn without smoke or carbon deposit.

In the older forms of the Diesel motor, the oil was sprayed into the engine by the action of a jet of air at a pressure much higher than the compression pressure. The action was that of a perfume atomizer, only on a much more intensive scale. When a heavy fuel oil is burned the pressure of the air which does the atomizing is as high as 1200 pounds per square inch. On the motor is a three-stage air compressor which operates when the motor is running, and air for starting and for the spray is stored at the required pressure in heavy steel flasks.

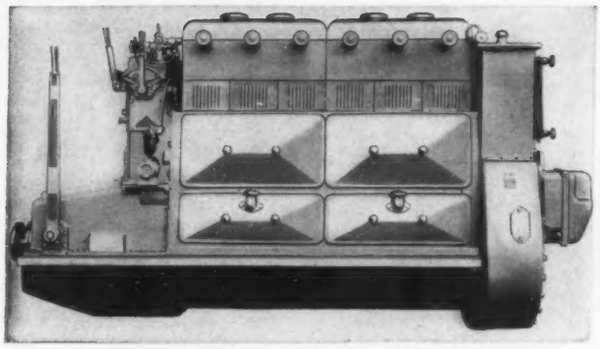
Obviously, such an arrangement is not suitable for a small motor which is to be taken care of by the unskilled owner. Not until a new and much simpler form of fuel injection was developed did the Diesel motor become a possibility for smaller units. Over twenty years ago some of the foreign builders began a series of experiments to get the requisite fineness of spray without the use of any spray air. The fuel was forced into the combustion chamber by a high pressure pump acting directly on the oil, and the nozzle was formed in such a way that the oil issued in the form of a mist so fine that it was almost a fog. With the liberation of the Diesel motor from the high pressure spray air and its accompaniment of coolers, high pressure piping, heavy flasks and the cost and weight of such equipment, small Diesel motors were made commercially and were installed in many trawlers, tugs and work boats of different classes. The weight and size of these models was such that they were not suitable for installation in small cruisers.

In the small Diesel using "airless fuel injection" one of the most vital points in the whole motor is this fuel injection system. Here the very finest workmanship and material must be used and only the most carefully thought out engineering must be employed in the design. Consider what the supply pumps of the airless injection system must do — and do accurately — and it is seen why this is the critical feature of the whole motor.

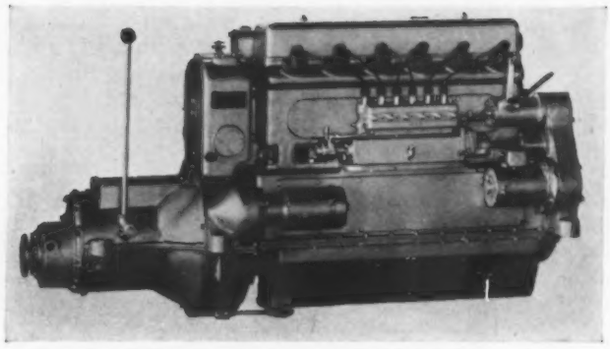
The pump — or set of pumps as is more commonly used on multi-cylinder motors — must draw fuel from the supply tank, measure it accurately, and then force the accurately measured amount through the spray nozzle at exactly the proper instant under a pressure of about 4000 pounds per square inch. Not only must it do this but it must continue the feed at the proper rate during the combustion period of the working stroke. Spray must start and finish without any dribbling. And to complicate matters still more, the pumps must do this not only for full load, using the full charge of oil, but must be variable in the amount they deliver from the minute quantity needed when idling, to the full load requirement. Naturally, the design of the fuel pumps and the control of the amount of the charge, and the design of the nozzles has been a most fertile field for the inventor. But what Hugo Guldner — one of the foremost German authorities on Diesel engine design — said twenty-five years ago is even more true today. His remark: "What is needed in Diesel engine design is less invention and more rational engineering," covers the situation.

That is what has been done in the past three or four years on the smaller Diesels. A few years ago they were in the development stage, the stage where the inventor had his way with them. After the test of actual service they have been turned over to the engineer and the "bugs" eliminated by careful design, rather than by additional invention, until the small Diesel of the present is quite as reliable a motor as the gasoline engine. Any owner can install a small Diesel now without fear of being stuck with an "experimental" job. It will run when he wants it to run and as long as he cares to travel. To show how far Diesel design has progressed in the past few years, it may be mentioned that the Guggenheim medal for the most outstanding performance in aviation was given to a company making a Diesel type aviation motor, and that the performance which won the medal was a world's record non-refueling endurance flight.

"Diane," built on the West Coast, is another 50-footer that was recently equipped with a 100 h.p. Diesel



The new light weight, high speed Winton-Diesel developed for the smaller pleasure craft. It develops 100 h.p.



Another Diesel motor developed for the small cruiser is this Hill-Diesel, with 3½" by 6" bore and stroke

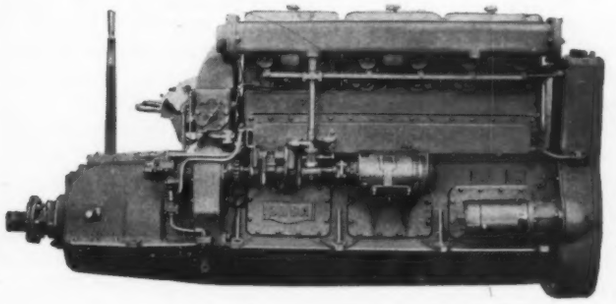
At the same time, however, an owner should have a clear idea of what he can expect if he uses a small Diesel in his cruiser, for the Diesel is not the universal panacea for all motor ills and misfits.

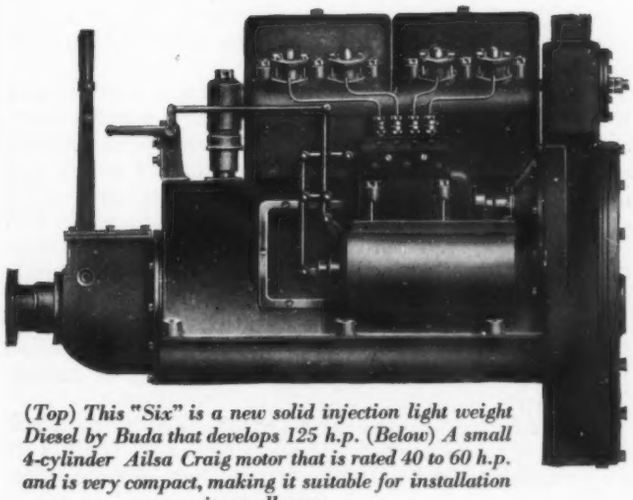
Due to the high temperatures and high pressures which are an inevitable consequence of the Diesel cycle, the average pressure throughout the whole cycle bears a much higher ratio to the mean effective pressure, which produces useful work, than that ratio in the gasoline motor. Any form of machine in which this ratio is high will be rather heavy for its power in comparison with another machine of the same power in which the ratio is lower. It follows that the Diesel motor will never be built as light as the gasoline motor using the same factors of safety. True it is that the weight of the Diesel of today is only a fraction of that of the models in use ten years ago, and that even further reductions may be expected; but it is also true that one can scarcely expect them to come down to the weight of the light gasoline motors because of the general principle stated above. Even the prize-winning airplane Diesel mentioned above is decidedly heavier than the gasoline models. When weight is of importance — and it is in many boat installations — the Diesel motor is certainly not the first choice.

But in the average small cruiser a moderate amount of additional motor weight is hardly noticed in the performance of the boat. What will the owner get if he uses one? First and foremost, will be the elimination of the fire hazard. This is a feature which cannot be too strongly stressed, and which will lead inevitably to a much wider adoption of this type for small cruiser work. When the owner installs a Diesel to cut out fire risk, he must carry out the installation of all other items of equipment in a suitable manner. It is not logical to use a Diesel motor to drive the boat and then carry gasoline for generators, galley stove, or launch. A small amount of gasoline carried in a tank out on deck is permissible, but it must be properly taken care of if the full benefit of oil fuel for the main engines is to be realized.

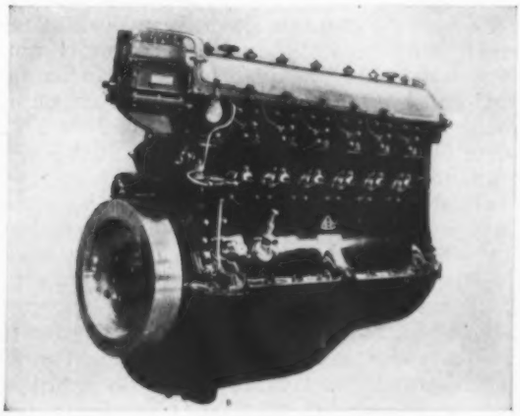
With regard to the reduced fuel cost which is the one reason usually advanced in favor of a Diesel motor installation, my own opinion is that it does not amount to much for the average cruiser. When the owner can buy a Diesel for the same price as he pays for a gasoline motor developing equal power at the same revolutions, then the saving in fuel cost will be important. But the average cruiser which is used for pleasure, is not operated much more than two hundred hours at full throttle — or the equivalent at reduced speed — during a season, and the saving in the price of fuel is not enough to pay for the interest on the additional investment in, and the

(Continued on page 112)

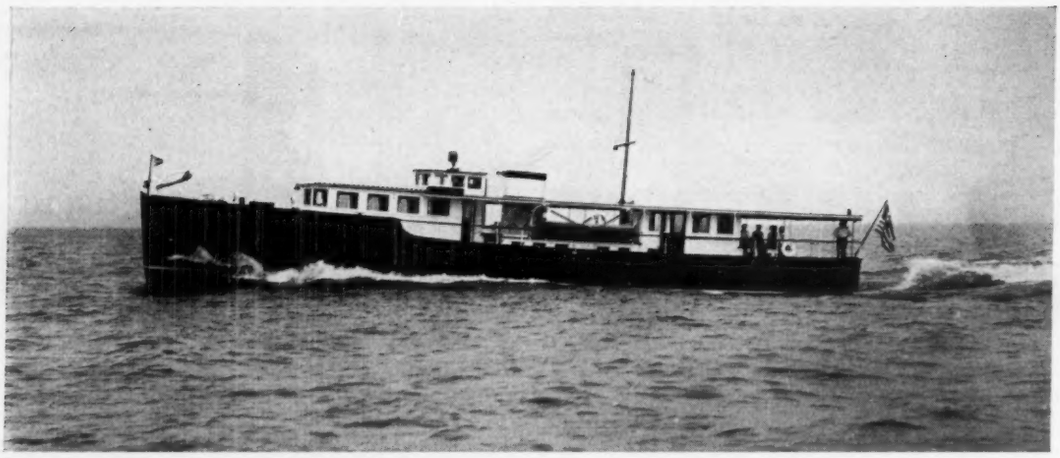




(Top) This "Six" is a new solid injection light weight Diesel by Buda that develops 125 h.p. (Below) A small 4-cylinder Ailsa Craig motor that is rated 40 to 60 h.p. and is very compact, making it suitable for installation in small space



The 150 h.p. Maybach 6-cylinder weighs 2000 lbs., or about 14 lbs. per h.p.



"Lenore II," owned by Sewell L. Avery, of Chicago, represents a new type of express Diesel cruiser. Only 90 feet on the water, she does better than 24 m.p.h. with two lightweight Winton motors of 500 h.p. each. Thomas D. Bowes was the designer and the Defoe Boat and Motor Works the builders

"Lenore II"—Something New in Express Diesels

Speed, Comfort, Weatherliness and Economy in the Coastwise Cruiser

By REGINALD W. CROWLY

TWENTY-FOUR miles an hour for 24 hours, at a cost of about $3.50 an hour, in a 90-foot hull with three double staterooms and two saloons, costing complete about $100,000, is to be had today by the express Diesel yacht in its most highly developed form.

This was achieved last year in *Lenore II*, the profiles and accommodation plan of which were published in these pages, June, 1931. On trials, with tanks half full and stores aboard, she made 24.25 miles an hour. Withal, being stout of hull and very weatherly, she is qualified for outside passages and is to be rated a coastwise yacht. She is a new type for a new purpose and in her is presented a combination of speed and weatherliness, the latter as designedly sought as the former. She is the busy man's yacht, able to lop off the miles in short order — a fast cruiser in which to go places in hours snatched at week-ends and on short vacations.

Distance has a new meaning when clipped off at 24 miles an hour. An afternoon's run becomes 150 miles; overnight, 300 miles can be reeled off; from noon to noon one can log nearly 600 miles. In a yacht of the type of *Lenore II* one can leave New York at midday and reach Narragansett Bay before seven. From Chicago one can make Mackinac Island in 15 hours. The run from San Francisco to San Diego becomes a matter of 21 hours. Miami can be reached out of New York in a little over 50 hours, with one refueling. That is what 24 miles an hour yields in 90 feet of coastwise express Diesel cruiser.

This type is ideal for those who lack time to make ocean passages or extended cruises, and for those who have not the leisure to live on their yachts or to entertain on them. Characteristically American in its response to the limitations of a business man's opportunity for relaxation, it is a type which offers a fuel range of two days or more, the requisite accommodations for cruising, and the speed which enables passages to be made that many could never make in a slower boat. With these qualities go the strength of hull necessary for maintenance of speed in quite a lively sea and the ability, also, for facing boisterous summer weather. Moreover, this type can slip quickly from its mooring and work nimbly up alongside any stage or float, with no fuss of launches or davits for boarding, making it readily available for brief outings — of an evening, for instance.

The type is neither a small version of a large yacht nor a Diesel version of a commuter, nor yet a hybrid of both. It is a distinctive, new type, hitherto unproducible because gas engines could not yield the cruising range, safety and low operating cost, while former Diesel engines could not yield the speed. It is a type that could have been used all these years had it been available, but it had to await the progress of two arts, namely, engineering and naval architecture.

Its greatest attraction is in its price and cost of upkeep. In relation to the capabilities and convenience of the type, the cost of the investment is low and the overhead comparatively moderate. There is an advantage, too, in the simplification of management, for, no matter how one organizes, there is much less bother with a crew of five than with a crew of thirty.

This combination of speed with cruising comfort and weatherliness, or — as one might call it — express cruising ability, derives from continuous research into lighter strength of construction, reduced weight of power and improved lines of hull. The study has been many-sided and all-embracing. It has involved developments in hull framing, improved hull fastenings and use of new materials; it has called for higher and higher engine speeds and lighter and lighter engine weights; it has comprised the subduing of sound and vibration; it has included new treatment of the plumbing, heating and ventilating systems; and it has embraced the testing of models in the Navy experimental tank in Washington.

Lenore II represents only a certain stage in the development, as *Normada* did, and *Sirene* and *Waleda II* and still other boats. In the future there will be a further advance, for already more power can be assured

from the same weight of engines, and progress lies still further beyond, for in the offing there is a slash to be made in the auxiliary weights. This story of development is just such a one as Kipling summarized forty years ago in a phrase which you may read in *MacAndrew's Hymn:* "We're creeping on wi' each new rig — less weight an' larger power."

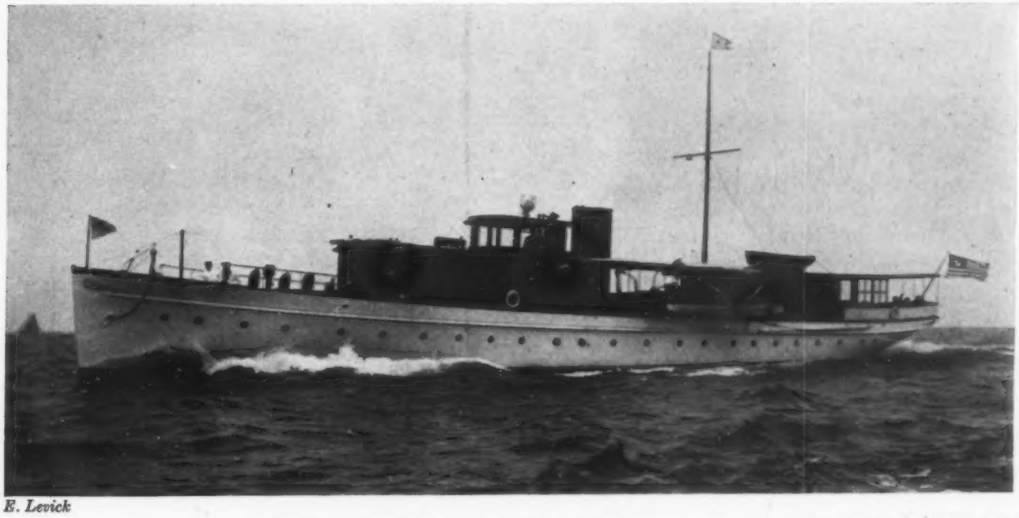
It is recognized that the type of construction used in fast gasoline cruisers and express steam yachts is not suited to the heavier working of Diesel engines. A light hull had to be evolved, strong and rugged and withal not prohibitive in first cost or maintenance. Steel not being well adapted to the express yacht below a length of 120 feet, and wooden construction leaving something to be desired as one approaches that length, a composite system was indicated. The longer center girder and greater rigidity demanded by the extra weight and stresses of the Diesel motors are thus secured by steel, and the relative proportion of metal used in the hull construction increases with the length of hull.

In *Lenore II* there is a backbone of steel plates, made up of four sister keelsons (in twin-screw boats), with enough steel bulkheads and steel floors to give the keelsons vertical stiffness, and with continuous deep belt frames in the machinery space. Lightening holes are liberally cut in the flanged steel plates to reduce the weight. This construction forms a long, deep girder or bridge extending the full length of the yacht. In it are mounted the main engines, shaft bearers and struts, all kept thus in perfect alignment, confining the vibration and reducing the strain on the fastenings in the wooden part of the hull. Auxiliary machinery and tanks are also carried by the girder.

Around the outside of this steel skeleton are worked the wooden frames and the double planking, and to fasten the frames and deck beams together a very strong tie has been devised. The beams are butted against the head of the frames, instead of being put alongside them, and a plate knee — fitted on the side of the frame and beam — is through-riveted into both members without interfering with the clamp and shelf. This is much more rigid than the usual knee system, even when the latter is carried out with forged knees.

On a boat of, say, 105 or 110 feet length a combination of bulb steel angles and intermediate oak battens can be used for the framing, the bulb angles being of such proportions that they do not have to be beveled. A sheerstrake of steel can be worked in inside the planking with a steel tie plate on deck to take the place of the wooden clamp and shelf. In this way an entire steel-framed inner form is built up, possessing great rigidity and strength for a given weight at very low cost, the electric welding and cutting outfit having rendered it not only possible but low-priced. This type of construction stays in shape much better during the building period than the all-wood type.

Joiner work also has contributed to the advance by reduction of weight and particularly by the subduing of

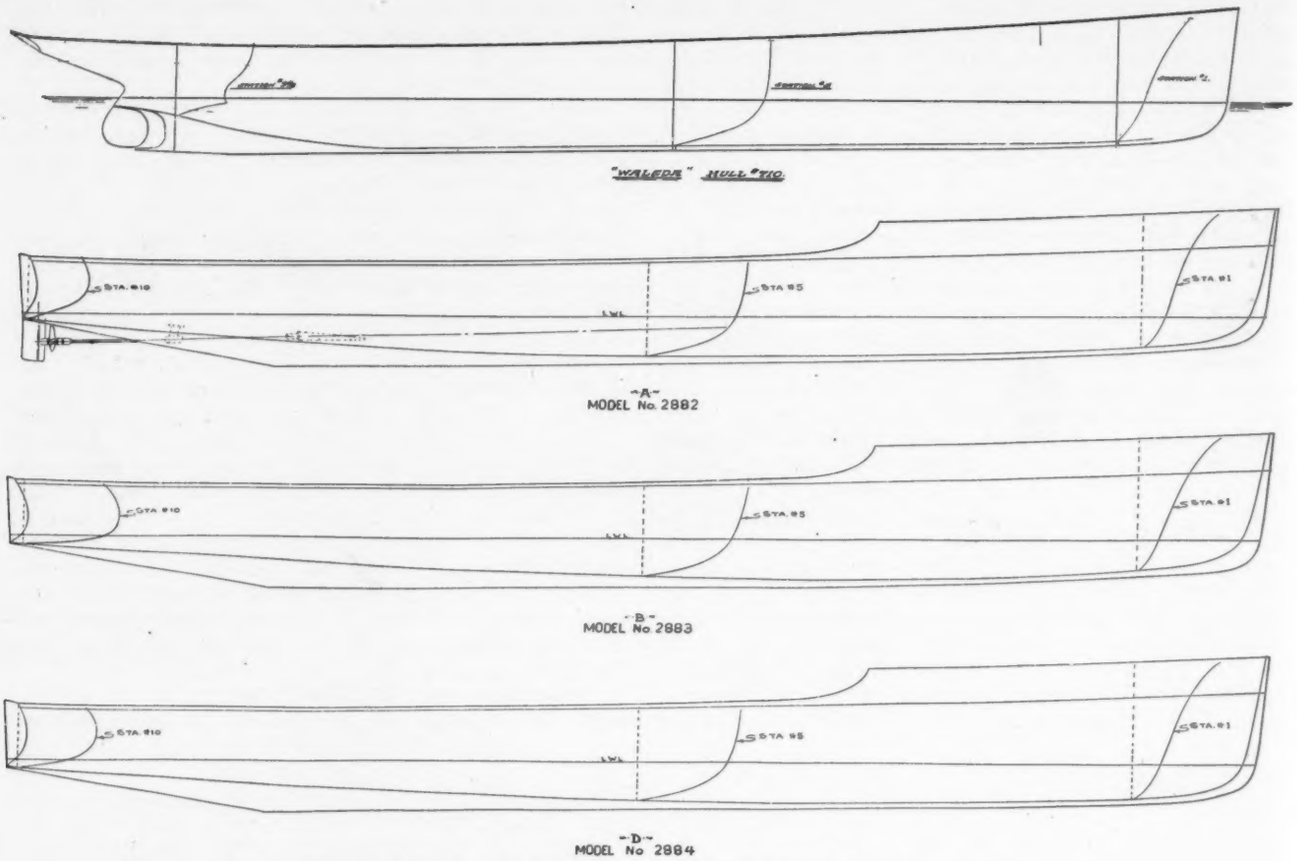


E. Levick

"Waleda II" marked the start of the hull development which produced the 24-mile-an-hour "Lenore." Owned by Commodore Walter H. Lippincott, of Philadelphia, she was built by the Mathis Yacht Building Company. Powered with two 300 h.p. Bessemers, she had a speed of 18 miles

M. Rosenfeld

Two years later came "Normada," owned by James Carstairs, and the speed had gone up to 21 miles



Lines of the models tested in developing "Lenore II." "Waleda" is shown for comparison

sound penetration from one compartment to another. Bulkheads are made up in large sections of two thicknesses of waterproof plywood with sound insulators between. The material cost is high, but the labor of fitting and installing them yields such a reduction in cost that a considerable over all saving results. This type of bulkhead lends itself to spray painting, so that a very pleasing finish can be obtained at a still further saving.

As the large, fast Diesel cruiser *Waleda II*, owned by Commodore Walter Lippincott, of Philadelphia, was the basis of the development under discussion she serves well as a reference for the advance. She is slightly larger than the $100,000 type around which this article centers. On the waterline

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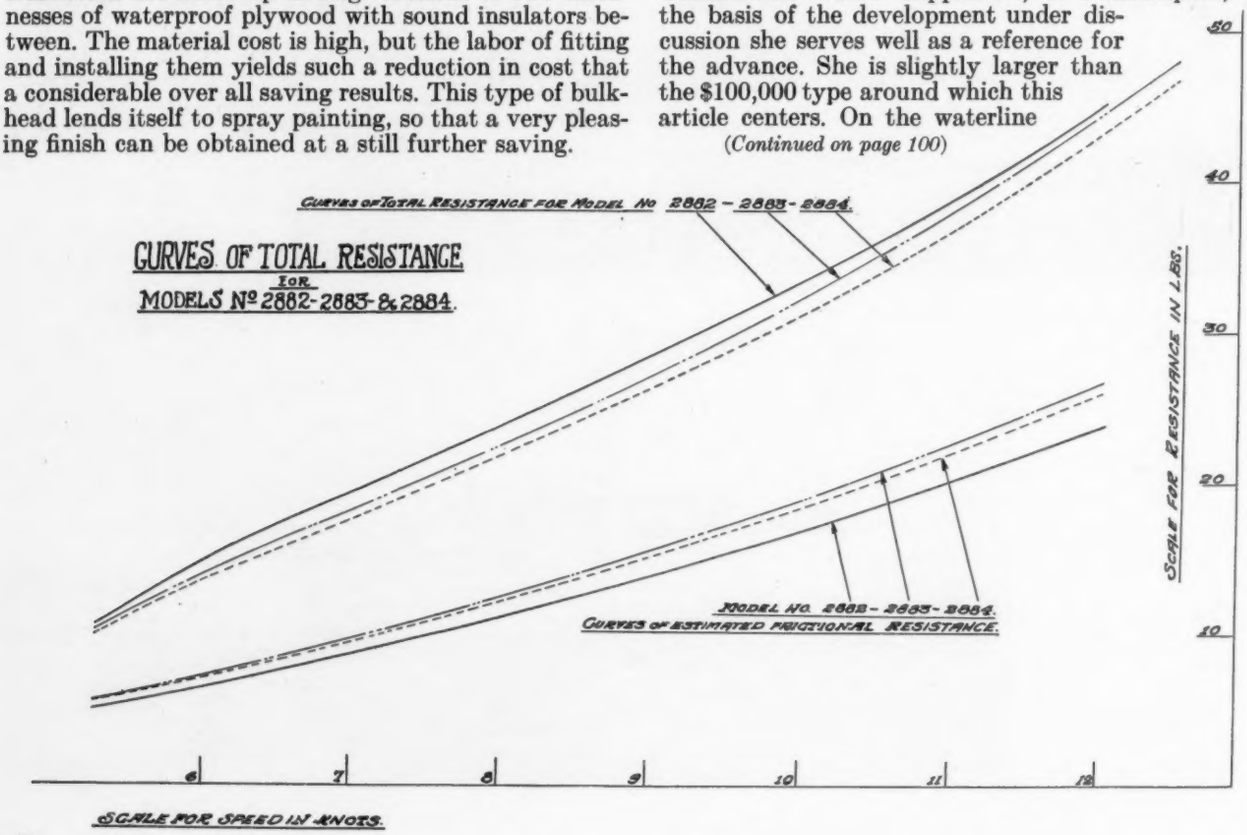


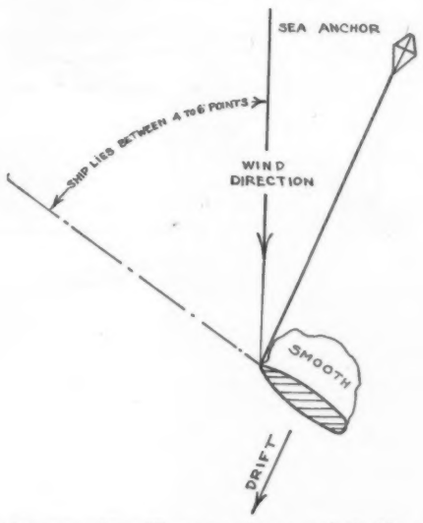
Heaving To

The Problems It Presents With Modern Rigs, and Their Solution

By CARL L. WEAGANT

WITH the steady increase of interest and participation in ocean racing and offshore cruising, the technique of heaving to in small yachts assumes greater importance. Knowledge of this technique is essential to safety at sea, but little attention has been paid to the handling of modern cruisers in a gale, and, as a matter of fact, little is known about the behavior of modern cruisers in a knock-down-drag-out blow. Few offshore cruising men have experienced a three-or-four-day storm at sea in a modern hull with cut-away forefoot and Marconi rig. Of course, a wealth of valuable information has been contributed by Claud Worth, Captain Voss and their contemporaries, but since that time hull and rig design have changed and the experience of *Neptune* and *Maitenes* in the last Fastnet Race indicates that these relatively modern types behave quite differently from the old gaff-riggers with deep forefoot. The modern cruiser is apparently more difficult to handle and, unless the proper steps are taken, at times may become unmanageable. Every man who cruises offshore is liable to get caught in a gale and, if he is unprepared to meet the emergency with the proper gear and knowledge of what to do, loss of his ship may result. How, then, shall a modern cruiser be equipped and handled?

Before continuing, a clear definition of exactly what is desired of a boat when she is hove to appears necessary. Contrary to common belief, a boat should *not* ride head to the seas or with her bow facing directly into the wind. She should lie between four to six points from the wind. The reason for this is that as she is driven off to leeward a smooth is developed to windward. This so-called smooth tends to iron out and flatten the oncoming seas. A common example of this action occurs when a sail boat in getting underway slides to leeward, leaving a smooth area of water to windward. This effect is probably caused by a sort of water vacuum which is created by the keel moving sideways. The cavity caused by the keel must be filled, and water rushes around the ends of the keel under water, and from the mass of water to windward. The water to windward, in flowing toward the keel, tends to suck the waves down with it, causing the smooth.



The diagram above illustrates the most desirable position for a boat to lie with sea anchor, or when hove to

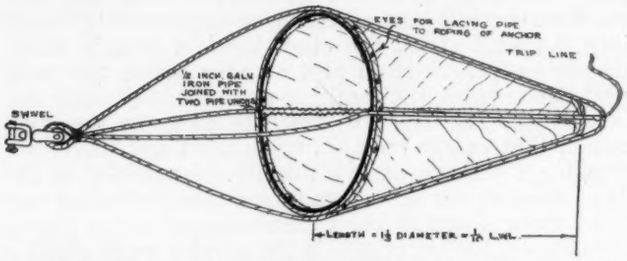
The second requisite of a boat hove to is that she neither move forward nor backward but remain as nearly stationary as possible, with the exception of the sidewise drift mentioned above. She should give with the seas. If a boat tends to forereach, that is, to fall off, gather headway, and come up into the wind with way on, then she will take a beating as she drives her head into the seas. If, on the other hand, a boat is either driven backwards stern first or runs before the wind under bare poles, the resulting wake tends to make the seas break. The seas are caused to break by the same action that causes breakers when wind and waves are bucking a current, as in a tide rip. The motion of the boat through the water sets up a current traveling into the wake and against the waves, causing them to pile up into crests. Added to this is the greater wave which a ship raises when she is driven hard.

My experience in heaving to is limited to one boat, *Carlsark;* but, because she had a modern Marconi rig and a decidedly cut-away forefoot, I believe that her behavior is fairly representative and that the lessons and conclusions drawn from the experience with her will contribute some facts of value. *Carlsark*, because of her cut-away forefoot, had a marked tendency to fall off beam to the seas, rolling violently and placing herself in danger of being rolled down on her beam ends. Apparently, *Maitenes* and *Neptune* acted in the same way.

This action is the result of two characteristics of the modern cruiser not prevalent in earlier types — the cut-away forefoot and hollow Marconi masts. The lack of forefoot allows the bow to be more easily driven off by wind pressure and the scend of the seas. The tall, hollow masts present much greater windage than the gaff-headed mast and, in all rigs except the schooner, this pressure is applied forward of the center of lateral resistance, further adding to the tendency to fall off. This mast windage, I believe, is an important factor when it is considered that the approximate mainmast area on an average forty- or fifty-footer is roughly fifty square feet, with a good portion of the area aloft where it receives the full weight of the wind, while a trysail, which is set to counteract this effect, is low down, partially sheltered in the troughs of the seas. Obviously, the cutter or sloop suffers most from this effect, the yawl less, and the ketch least. The mast windage on a schooner rig tends to drive a schooner into the wind; but the schooner sailor need not lay this article aside, because no one knows exactly how a boat is going to heave to until she is tried, and there may be some lessons here that will be useful. Furthermore, the wind pressure, in reversing its effect on schooners tends to make them forereach, which is decidedly undesirable.

To counteract falling off, a trysail is normally set, but where, of what size, and of what cut? When fitting out *Carlsark* for her Atlantic passage it was my belief, which I think is fairly common, that any sort of a triangular sail, provided it was made of extra heavy canvas, would

serve as a storm trysail. Accordingly, I secured a heavy fisherman jib in Nova Scotia. Experience soon taught that there were two things radically wrong with this sail. It was too small and too baggy, cut too full. Just how large a storm trysail should be I cannot say with assurance; roughly, I would say between three and four times the windage area of the mainmast. The center of effort of mast windage could be readily calculated and a trysail of sufficient area to balance could be designed and placed so as to balance the boat with respect to its center of lateral resistance. With this balance established, I would then make the sail larger or set it farther aft to throw the center of effort well behind the center of lateral resistance. That is, make the balance tend to put the head of the boat into the wind to counteract the force of the breaking seas which work to drive off the bow. This does not mean that a boat should lie head into the seas.


EYES FOR LACING PIPE TO ROPING OF ANCHOR
TRIP LINE
½ INCH GALV IRON PIPE JOINED WITH TWO PIPE UNIONS
SWIVEL
LENGTH = 1½ DIAMETER = ¼ LWL

A substantial sea anchor with galvanized iron pipe ring to spread and weight it

Carlsark's trysail was about fifty square feet, roughly, the same size as the windage area of the mainmast, and although it was set on the mizzenmast where it would be of greatest effect in driving the bow into the wind, she fell off badly. That is why I suggest a trysail nearly triple the size of the mainmast area. The second fault with the sail was that it was so baggy in cut that there was no forward drive in it. This does not mean that a trysail should drive a boat forward, but it should prevent the boat from being driven backward by windage and breaking seas, especially if there is a lee shore to be considered. We all know that the harder the wind the flatter should be the cut of the sail; therefore, to have an efficient driving sail for winds of gale velocity it should be cut as flat as a board.

In a ketch or yawl we often hear of heaving to under a double-reefed mizzen. I do not believe in this for two reasons. First, the ordinary working sail is not made to withstand the high wind pressures of a gale and, second, the setting of any working sail necessarily involves the use of a boom. Booms (and Conor O'Brien will second this statement) are dangerous weapons in a gale. A good loose-footed trysail can be sheeted to some solid fixture on the deck.

The setting of the trysail raises the question of how it shall be fastened to the mast. On a gaff-headed mast it can be laced on, preferably with single lacing pennants for each point and not a continuous lacing line. On a Marconi mast lacings will serve, but they are apt to be cut by the track if it protrudes from the mast on a batten, which is usually the case. The only remedy for this is to fit the trysail with slides and set it on the track, but in order to set it the mainsail slides would first have to be removed, which is troublesome and undesirable. Hence a gate in the track above the highest point of the mainsail when stowed would be advisable. If the trysail is to be set on the track, the track must be strong enough to stand the strain of the trysail. The point on the track at the head of the trysail will receive the greatest strain and it would be wise to double fasten the track to the mast at this point or else bolt the track through the mast.

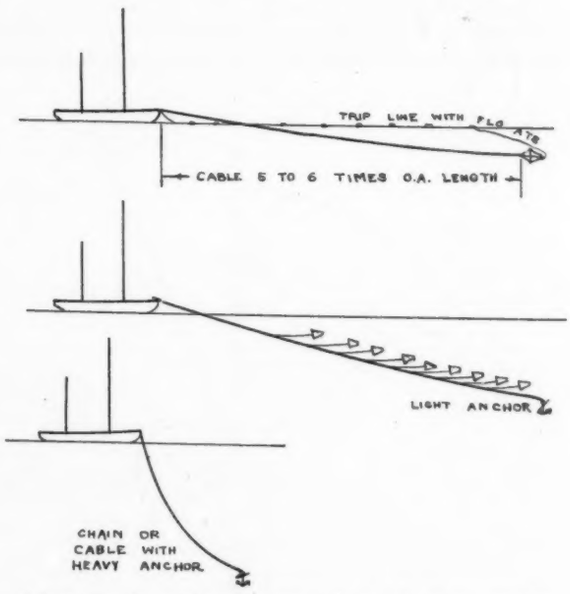
So far, I have assumed that the boat's head would fall off and that the trysail must be set as far aft as possible, and that no jibs would be used. Suppose you have prepared your boat, assuming that her head would fall off, and then find in practice that she heads up too far and forereaches, and comes up into the wind with way on. On a ketch or yawl the trysail can be taken off the mizzen and set on the main. If she still forereaches, which is highly improbable, set a staysail or storm jib, and remove the trysail. Or a combination of the trysail on the mizzen with the storm jib may work best. If she forereaches with this combination, sheet the jib to windward, a method applied on schooners prone to forereaching.

On the other hand, one may discover that even with a good trysail the boat's head will still fall off and that she will lie beam to. With a cutter or sloop rig this is very apt to be the result, because the storm trysail must be set well forward, due to the placement of the mast, and it may be physically impossible to balance the boat. We read that the old English cutters could heave to with a storm staysail, but I am doubtful if any modern Marconi-rigged cutter with cut-away forefoot would behave so well. However, the sloop, and any other rig for that matter, has recourse to a sea anchor, or they may even heave to stern first.

During the winter that *Carlsark* weathered the Mediterranean we were hove to, at one time, for three days in a severe Mistral, a northwester, and all methods of heaving to were given a good test. She was hove to under trysail alone first on the main and then on the mizzen. The sea anchor was soon added to check her bow from falling off, and finally we hove her to stern first with the sea anchor. *Carlsark* was being driven southward toward a harborless and stark lee shore on the north coast of Africa, and so I retain a vivid impression of the effectiveness of sea anchor and storm trysail.

We found that heaving to stern first was more un-

(Continued on page 112)



A boat may be anchored at sea with one large sea anchor, with a series of small ones or (in an emergency) with an ordinary anchor and cable

The building of the "Griffin," 1679. A reproduction of the copper-plate engraving first published in Hennepin's "Nouvelle Decouverte," Amsterdam, 1704

"Griffin" Hunting on the Great Lakes

By C. H. J. SNIDER

CRUISING hither and yon one comes upon much rich experience in addition to seafaring. Last summer we were prowling about the Grand Manitoulin in G. Herrick Duggan's topsail ketch *Glencairn*, of Montreal. This editorial "we" is surely justified, for Mr. Herbert L. Stone, editor of YACHTING, was one of the party, trying to wash the salt of the Atlantic out of his eyebrows with the sprays of the Great Lakes — including a go at the Mackinac Race.

Manitoulin is said to be the largest island in the world surrounded by fresh water, and its hundred-mile bulk is interposed between Lake Huron and the great North Channel of Georgian Bay. At Little Current, on the island, we heard of the supposed remains of La Salle's "barque *Griffin*," a ship as interesting in her way as Hendryk Hudson's *Half Moon*. They were said to lie on the shores of Mississagi Straits, which chop off Cockburn Island from Manitoulin; and thither, with Herrick Duggan's hospitable assistance, we steered.

The wreck in 1927 before the uncovering process began

"High above those black crows shall the gallant griffin soar!"

It was René-Robert Cavelier, Sieur de la Salle, who said it, as he strode, scarlet-cloaked, along the stone bastions of Fort Frontenac — the modern Kingston, Ontario — where the waters of the five Great Lakes funnel into the St. Lawrence for the sea. The griffin was the cognizance of the speaker's patron, the Count de Frontenac, governor of New France. The black crows were the Jesuits, foes of both. The year was that of 1678.

Jealous for monopoly alike in souls and beaver skins, the sable-frocked, self-sacrificing fathers had already carried the cross and commerce as far north and west as Superior's frigid waters. They planned a priestly empire, sustained by the contributions of multitudes of converts. Within its wilderness confines they welcomed neither rival orders of religion, nor traders, nor explorers. La Salle's ambitions, cut across their path.

Ere the year was out La Salle began building a "barque" above the spot where the great cataract of Niagara interposed a 200-foot wall across the water route to the west. This was direct invasion of the Jesuit domain. On stern and beak-head he carved the armorial bearings of his patron, and he named her the *Griffin*. First of all shipping to part the surges of the Great Lakes west of Niagara, in the following summer the *Griffin* won as far west as Green Bay on Lake Michigan. Here she was illicitly laden with furs — La Salle had no license for the trade there — and was sent eastward in hot haste, to placate creditors who had seized his holdings at Frontenac. La Salle himself, and the greater part of the original ship's company of thirty-one, remained in the west, to prosecute discovery and gather more furs. The *Griffin* went eastward in the charge of her "pilot," or sailing master, a Danish sea captain named Luc, with five sailors. She was never seen again, and her fate has been as much a matter of speculation upon fresh water as has been that of the *Marie Celeste* on salt.

The wreck has been reduced to a rough rectangle

La Salle himself suspected the sailing master of running off with her, to trade with the Indians on his own account. He thought he recognized him in a distant glimpse he had, long afterwards, of a white man held prisoner by the Ottawas. The loss of the vessel and cargo bore so heavily that he named the little stockade in which he vainly awaited her return Fort Heartbreak. He had fashioned her with incredible difficulty, surrounded by hostile savages, in a wilderness whither every spike had to be brought from France, and "the carriage of every hundredweight from Fort Frontenac cost eleven livres." The livre was worth twenty cents; but its purchasing power in 1678 was the equivalent of modern dollars.

Father Hennepin, a Recollect priest who tagged on to La Salle, wrote of the *Griffin*, in a book published in 1704:

> "It came to anchor at the mouth of the Lake Illinois (Lake Michigan) where it was seen by some savages, who told us that they advised our men to sail along the coast, and not towards the middle of the lake, because of the sands that make the lake dangerous when there are high winds.
>
> "Our pilot, as I said before, was dissatisfied, and would steer as he pleased, without hearing to the savages, who, generally speaking, have more sense than the Europeans think at first. But the ship was hardly a league from the coast when it was tossed up by a violent storm, in such a manner that our men were never heard from since; and it is supposed that our ship struck upon a sand, and was there buried."

Neither La Salle nor his "pilot" stood in the good books of the clergy. Hennepin knew that the Dane would come to no good end. When they had been caught in a blow going up Lake Huron, and all began to call on the saints and vow a chapel to Saint Anthony of Padua, after lowering the mainyard and topmast, that abandoned wretch had refused to pray, and he had damned La Salle up hill and down dale for bringing him from salt water to perish ingloriously on fresh. Which was a warning, in a way, to us in *Glencairn* to treat the editor of YACHTING right.

Father Hennepin's specific account of lowering the topmast and mainyard increases the probability that the rig of the *Griffin* was simpler than that given her by modern artists, including the writer. Topgallant and fore-and-aft sails shown may be superfluous. A naïve portrait in a contemporaneous book shows only a jib, lug foresail, lug mainsail, and topsail. And this may have been her whole rig. This picture shows a large carved griffin on the beak-head under the bowsprit, and an eagle perched on a sort of kiosk at the stern.

The theory upon which the wreck at the western end of Manitoulin was identified as the *Griffin* had been evolved by the late Harry G. Tucker, barrister, of Owen Sound, Ont.

It was that Pilot Luc, either running for shelter in the North Channel, or with the intention of making off with the ship, had come to grief on the Magnetic Reef, which, just awash outside Mississagi Straits, plays hob with the compass. Pounding over, the wreck had driven up past Mississagi Point, and so ashore, and the crew had perished of frost or starvation.

Skeletons found in two caves near the wreck strengthened Mr. Tucker's theory. So did the find of a large silver watch nearby, with the works rusted away; and of a length of chain with hand-hammered square links; and of bell-shaped leaden objects, supposed to be cannon rammers; and of a cannon ball; and of strips of lead filling the seams of the shattered hull.

Mr. Tucker's ingenuity in fitting the evidence together made converts of everybody in the island; particularly as the oldest inhabitant, an Indian named John Francis, reputed to be ninety, said that his father before him had known of this wreck from boyhood.

There is no lying in Mississagi Straits, other than imported prevarication. The bottom is deep, and hard rock, twenty fathoms close up to either shore. All winds have a three-mile sweep. The shores are savage with sharp stones, and offer very little beach. They look like ruined masonry, crowned with trees. The nearest harbor is Meldrum Bay, eleven miles around the northeast

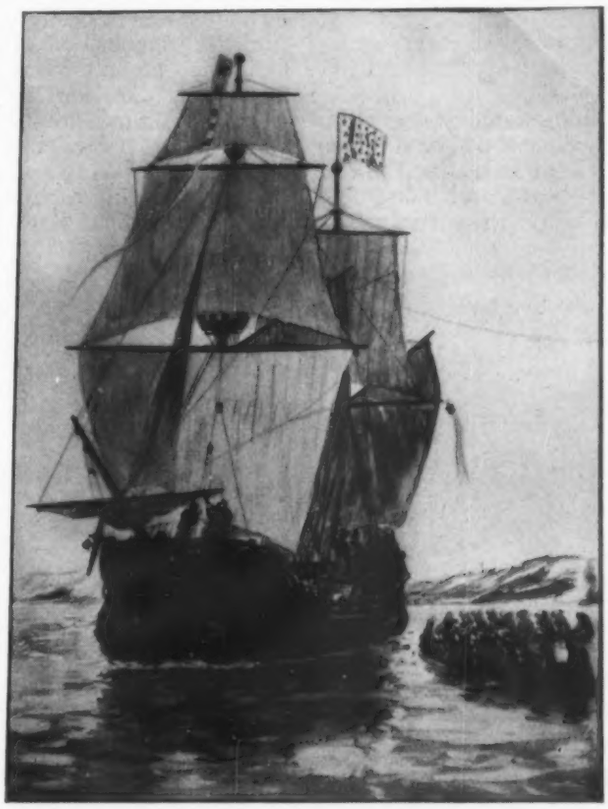
corner, in the North Channel; eleven miles, that is, from Mississagi Light, on the point of the same name.

So we attacked the wreck overland, starting from Meldrum Bay.

Mississagi Light, on the east side of the straits, was the finger post. The wreck was said to be a mile north of it. One strand of wire, the light-keeper's telephone line, led through the woods. We followed it, on a trail hot as Tophet, over rocks and through sloughs dried up by the July heat. Sometimes the wire was on poles and sometimes on trees, and sometimes it knocked our hats off. But after tracing it for four miles we heard the crash of surf on shingle and emerged into the open and saw the white lighthouse. W. A. Grant, the keeper, and his son John, were expecting us. One look at the savage "beach" had decided us against walking up. Their launch, a lifeboat salvaged from the wreck of the *Turret Crown* in those parts, rode uneasily in an angle between the wharf and the shore. This they manned, and, towing a punt, ferried us a mile northward in short order.

Close to a black cleft in the gray rock wall they anchored. There was next to no wind, but the current was running out of the straits like an ebb tide, and the water tossed and heaved like the rapids of a river. It was only a few yards to the rocks, and for this transfer the punt was useful. After some negotiating we managed to hop out, dry shod, on to the jagged boulders and splintered stones which formed the "beach."

Right in front of us was the wreck. Pitifully little of it. Grant said the mass had been twenty feet wide and forty feet long thirty years before. It was then bedded in the shingle, at the water's edge, and was supposed to be of greater extent than appeared. But an uncovering process, begun by winter gales in 1929, had swept away the shingle and left bare all there was of it; and a low-water season on the Great Lakes in 1931 left it several yards inland and several feet above water level. It had evidently been stranded a long time, for a wild cherry tree had grown up from a cleft in the timbers. But the fires of campers and the assaults of hundreds of tons of ice and shingle, hurled by southwesterly gales, had reduced the main mass of wreckage to a rough rectangle, thirteen feet by ten. Individual timbers were scattered along the shore, wedged among the stones, for hundreds of yards; and a fish tug, recently anchored in the Straits, had brought up two frames and some planking on the flukes of her anchor, from 125 feet depth. Not far from the largest fragment of the wreck lay a pair of floor timbers and a section of ribband or wale-strake.



La Salle's "Griffin," from the picture which the author considers over-elaborate, in the John Ross Robertson collection of Canadian Historical Pictures

The main mass of wreckage consisted of a pair of sister keelsons, each originally a twelve-by-twelve timber, side by side, drift-bolted together with ⅞-inch bolts of iron, and through-bolted to eight floor-timbers. These were in pairs, two inches apart, each floor six inches wide and twelve inches deep, and the members of each pair touching. Heavier bolts of inch iron, three feet long, some with square nuts attached, projecting a foot or more above the keelsons, indicated that another timber, at least a foot in diameter, had capped the latter. The bolts had large, loose-fitting washers, flat, hand-wrought rings. There was no trace left of keel, planking, or ceiling, other than innumerable spikes, curled back and bent into the floors by the grinding of ice and shingle. Some of these spikes were eight and ten inches long, and a few were six inches. All the wood was oak, much decayed. There were some holes, but no convincing evidence of trenails having been employed. The only fore-and-aft timber, except the keelsons, was a fragment which seemed to have been originally nine inches wide and six inches thick, worked into the outer faces of the floors by mortices an inch deep, the floors being scored to the depth of an inch to take it. The floors projected about five feet on either side of the sister keelsons. The longest measured thirteen feet.

Here was all the tangible evidence. The planking, and the lead strips which had filled the seams, had all gone. Grant, the lighthouse keeper, was positive about the lead "caulking." He had picked it out in his boyhood. It was a mistake as to what metal it was, he said, which led lawyer Tucker to assert that the wreck had once been caulked with wedges of copper, and to theorize that La Salle had been in contact with the copper-using Indians of Lake Superior. Two other objects of lead were found, shaped like bells or flower pots, the base hollowed out to a hemisphere, the top deepened to form a socket. In one of these was a fragment of oak. Grant had been told by a man-of-war'sman that these were rammers for brass cannon. Another fisherman has since suggested that they were the sinkers for poles used to keep a tunnel-net open, and that they had got mixed up with the wreck and tossed up with it from deep water. Grant did not entertain that theory; but he himself had long before cut up the lead which once filled the seams for sinkers for gill nets.

The silver watch found had disappeared during the regime of a previous light-keeper, to whom it was entrusted. The cannon-ball clue likewise vanished. The ball was not found near the wreck, but nine miles away, on a portage possibly used during the War of 1812 or afterwards.

One cave where the skeletons were found was the black cleft we had noticed before landing. There had

been seven skulls, and they had been at the lighthouse until the then keeper, panicky in a gale which threatened to lift the tower off its base, threw them into the straits. That was forty years ago. One skull was much larger than the others. Enthusiasm for the theory that the wreck was the *Griffin's* produced the statement that this skull must have been the Danish sailing-master's, because he was "of gigantic stature." Authority for that statement may exist; but if it does it would not remove the awkward fact that the *Griffin's* crew consisted of six men, including the sailing-master, and seven skulls were found. It is not probable that they carried a "spare." In an adjacent cave or crevice two more skulls were found a few months before our visit. They were old and weather marked. Fragments of cedar bark wrappings with them explained the presence of all the skulls. The Indians of Manitoulin Island for centuries deposited the bones of their dead in caves. Collections of skulls have been found in caves from one end of the island to the other. Towards the east end one promontory is named Skull Point.

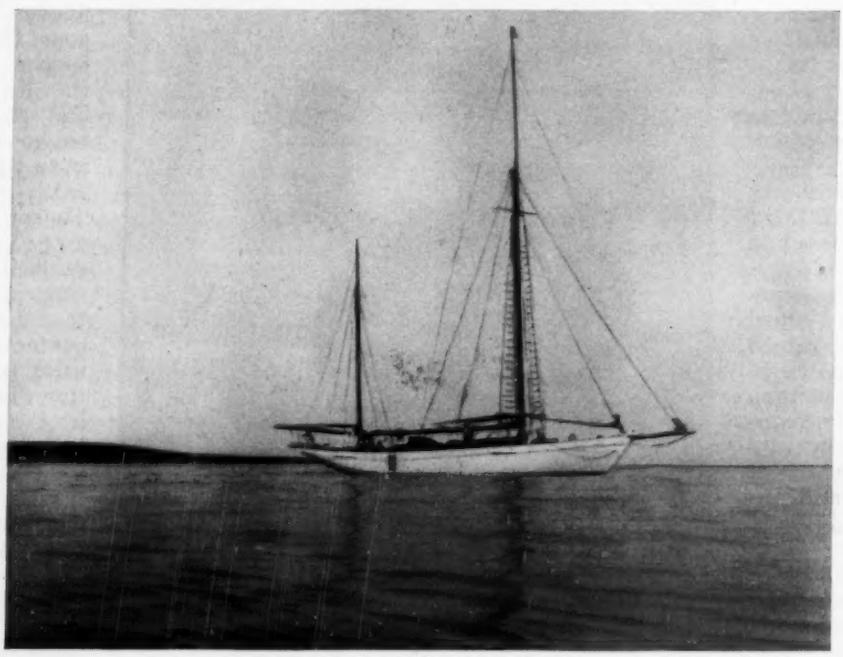
So the evidence of the skulls got us no farther. There remained the deductions to be drawn from the wood and iron of the wreck.

The floors and keelsons remaining were heavy enough for any Great Lakes trading schooner of 300 or 400 tons burden. The 300-tonner of the Great Lakes used to run up to 100 feet in length, 22 feet beam, and 8 or 9 feet depth of hold; and for such a vessel these twelve-by-twelve sister keelsons and six-by-twelve floors doubled, and in pairs only two inches apart, would be amply heavy construction.

Now the *Griffin*, according to Father Hennepin, who says he was asked "to drive the first pin" when her keel was laid, and who saw her launched and who sailed in her everywhere except on her final voyage, was from 45 to 60 tons burden. She was not a large vessel. It is on record that four men carried her "great anchor" up the Niagara portage, so it could not have weighed more than 400 pounds. Even a century later eight feet of draft was all that could be carried through the St. Clair flats. The Provincial Marine schooner *Dunmore*, in the year 1794, grounded when drawing six feet, and had to be lightered, and took days to get through the shallows into Lake Huron. The *Griffin* was small enough to be handled by six men, when all work was done by the "armstrong patent." The picture Hennepin gives of her on the stocks, engraved for him 25 years after she was wrecked, may be taken as a fair indication of her size, even if it does have palm trees growing beside the Niagara river. This engraving shows a galliot-like vessel, with the griffin carved on her stern. Judging by the figures of the men shown at work on her she would not be more than 45 feet long on the keel; and this would be long enough for a vessel of from 45 to 60 tons; and long enough for an explorer's craft which had to push her way through unknown waters and moor amid wilderness surroundings.

Then, we asked ourselves, how big would the timbers of a vessel of 45-foot keel be in the year 1679? Echo only answered, but there were the famous Bowrey papers to go on. These give hundreds of details about the construction of the *Mary Galley*, built by Thomas Bowrey in 1704. She was a three-masted ship and made voyages between England and the East Indies. She was 63 feet on the keel and about 75 feet long on deck; larger, therefore, than the *Griffin*, either as pictured or described by Father Hennepin.

The dimensions of the *Mary Galley's* principal timbers, preserved in the papers of her owner and published by the Hakluyt Society, are: keel, 9 inches square; floor timbers, 8 inches by 5½ inches, for six or eight timbers amidships, and elsewhere 6 inches by 5 inches, set on 19-inch centers; keelson, 9 inches across and 8 inches deep. The *Mary Galley's* tonnage is given as 160 in the papers. This exceeds her calculated tonnage by a considerable margin, there being apparently as great a discrepancy between carrying capacity tonnage and registered tonnage then as now. She was manifestly larger than the 45-ton or 60-ton *Griffin*. Yet her timbers were very much lighter than the 6 by 12 floors doubled, on 14-inch centers, and 12 by 12 doubled keelsons, of the wreck on the shore of Mississagi Straits. These timbers must either have formed part of the frame of a vessel ten times as large as the *Griffin*, or the latter was built as a floating wood-yard, with enough timber and iron in her to make a fair load of itself for a ship of her size to carry. Such a dray would have been quite impossible for six men to pole off the shoals and "track" through rapids, as had to be done with the *Griffin* time and again.

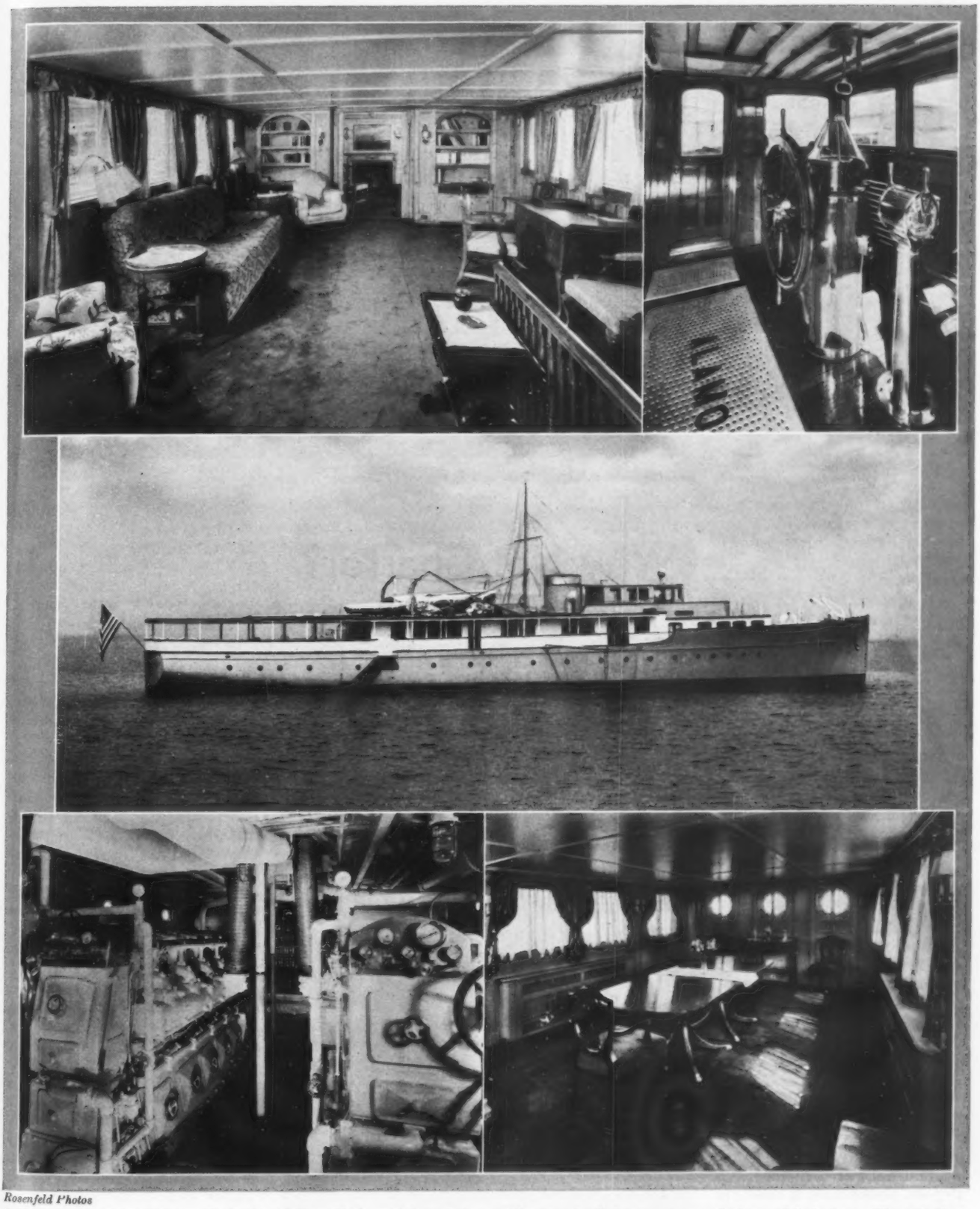


"Glencairn" cruising the islands

The conclusions to be drawn from the timber made us exceedingly doubtful about this ever having been the *Griffin*. We gathered a back-load of nuts, bolts, spikes and splinters, and chug-chugged back to the lighthouse, where son John had tea waiting for us. After a pipe, in the gray of the gloaming, we hit the telephone-wire trail in reverse and argued the thing out as we plodded the four miles up hill and down dale back to the main

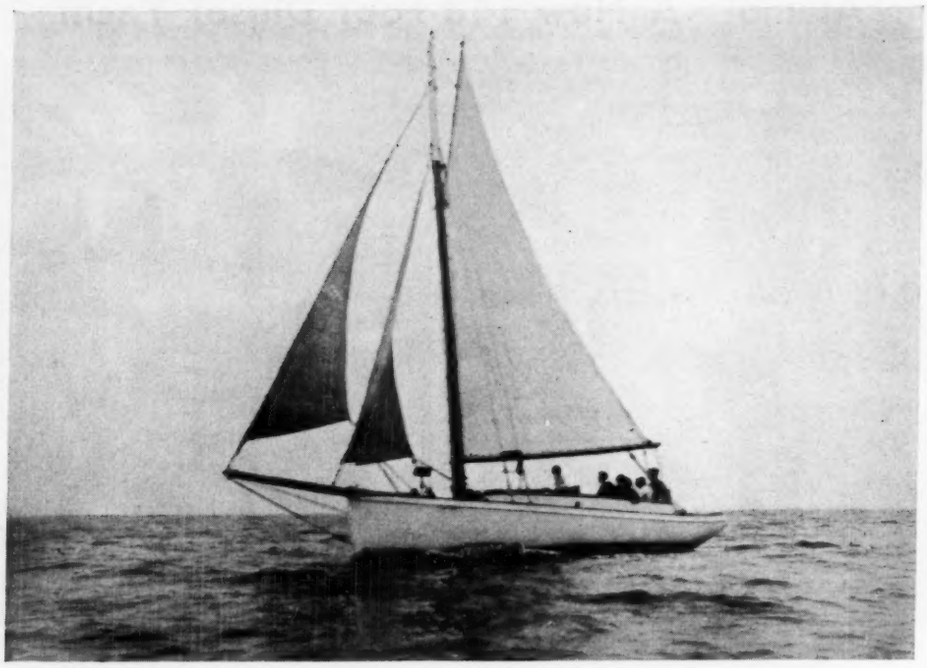
(*Continued on page 108*)

"Alamo"—A New 148-Foot Diesel Yacht



Rosenfeld Photos

"Alamo," owned by William F. Ladd, of New York, and launched recently on the Delaware River, is the latest fast Diesel to be built. She shows, therefore, the modern development in this type of vessel for coastwise cruising and short ocean runs. Built of steel throughout, from designs by Tams, Inc., she is a handsome and well proportioned yacht, with attractive living quarters and plenty of deck space. The reproductions show the living rooms in the after deckhouse, the dining saloon in the forward house, which is slightly depressed, and the engine room. Two 375 h.p. Winton motors give "Alamo" a speed of 16 m.p.h. Mathis Yacht Building Company were the builders



"Mercedes," an able "down easter," gave two summers of inexpensive cruising along the New England coast

Why Not Charter?

Cruising Inexpensively—How It Has Been Done

By J. D. THOMPSON

IT HAS long been my belief that there are many potential sailors confined to golf links and tennis courts solely because of an erroneous idea that their secret passion — cruising in sail — is a rich man's sport quite beyond their limited means. This misconception arises, no doubt, from the general impression that yachting must of necessity entail such expensive adjuncts as a high-priced floating palace, a crew of trained sailors, and membership in some well-known and correspondingly costly club. The layman does not always realize that probably the most enjoyable type of cruising is that afforded by a relatively small boat handled in conjunction with one's friends — who also help share the burden of expense. To step on board such a vessel is to enter one's vacation residence, with the overhead taken care of in the charter; and the cost of the trip can be made to compare favorably with that of any vacation sojourn at the seashore or in the mountains.

"Carlsark," with her new cutter rig, was sailed from Greenwich to Casco Bay, Maine, and return during a vacation of two and one-half weeks in 1931

My own experience, of cruising each year since 1926 with Tom Floyd-Jones and other friends, is living proof of the correctness of this theory, and I daresay there are innumerable other sailors of equally limited means who could also offer figures to back my own. Tom and I, in our six years as shipmates, have tried three distinct types of cruising, and at no time have our individual expenses for any one summer exceeded the sum of $365. The average, as a matter of fact, is nearer $200.

The three types of cruises mentioned include coastal cruising, or "harbor hopping," in a small auxiliary not more than 35 feet over all, where time is no object and harbor visits as long as desired; ocean racing in a schooner not under 65 feet in length; and coastwise cruising in medium-sized auxiliaries

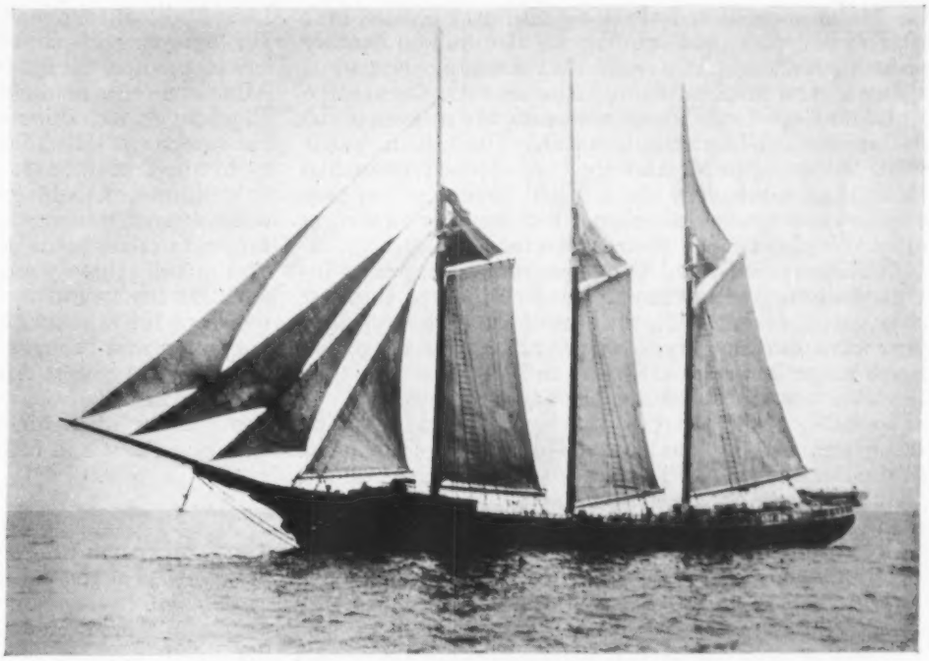
providing considerably more comfort than the first classification and possessing the speed necessary to "get places" in the decidedly limited time afforded by a two-weeks' vacation. I submit a brief résumé of our experiences (and expenses) in the hope that it may reach the attention of some would-be sailor in a sandtrap behind the fourteenth green and persuade him to concede the hole and commence looking for what he really wants in one of the numerous boat yards along the coast.

+ + +

Our maiden trip, in 1926, was a slightly unusual case, in that we got our boat — the 30-foot yawl *La Cubana* — free, on the condition that we outfit her for the season. As outfitting included the purchase of one new mizzen and two new headsails, which were made in Stamford for the total sum of $150., the bargain was not an exceptional one. We made up for this somewhat, however, by doing enough of the work on her to keep the yard bill below one hundred dollars, even if we did have to put up quite an argument to be allowed to work on her hull. *La Cubana* was no ball of fire, as boats go, but at least she initiated us into the joys of cruising that delightful area lying between our home port, Greenwich, Connecticut, and Nantucket Island, giving us our first real visits to the harbors of Eastern Long Island Sound, Fisher's Island, Judith, Newport, the Elizabeth Islands, Martha's Vineyard and Nantucket.

There were only three of us on that trip, yet our expenses for the whole business totaled exactly $450., or just $150. apiece. Our bill for provisions was high that year at $125., but that was unquestionably due to our inexperience, and was never equaled, relatively speaking, in the years which followed. On the whole, though, if that figure of $150. starts you back towards the golf links, just estimate what any other five-weeks' vacation would set you back!

Early in 1927 Tom bought a 35-foot "down east" sloop, the *Mercedes*, for $1,000; and as that was the same sum for which he sold her three years later, we have always considered that absolute possession of her cost but $60. a year, or the rather mythical six per cent interest rate on the principal involved. She had a sweet line if ever any boat had one, but the labor necessary to put her in shape was appalling. However, we set to work on her as soon as the snow was gone, scraping, caulking and painting literally for weeks on end, and what the yard rules wouldn't permit us to do ourselves my brother Gordon and I paid for to help make up for Tom's layout. With paint and incidentals totaling $30., and the yard bill close to $80., we finally got her overboard for a sum less than $200., including the interest mentioned above.



Old lumber coasters still ply their trade along the New England and Nova Scotian coasts

Our destination that summer was Maine, probably because my brother had a feminine objective in that section of the world. We actually got no further east than Newburyport, Mass. From the moment we weighed anchor at Greenwich everything was "ag'in us." The engine, set on too sharp an angle, froze stiff shortly after we started — and indeed the poor thing never ran again. Relying, then, solely on sail, we met nothing but fog and head winds all the way down the Sound; and finally, after a day's break in the weather, we blew out our weak mainsail in a nasty sou'wester off Point Judith. Six days after our departure from Greenwich we limped into port at the Vineyard, where we spent the better part of another week mending sail and replacing our mechanical scrap iron with one of those one-cylinder two-cycle "putt-putts" that can run upside down — if you know the combination!

That summer was the first time we had been east of Cape Cod, so after giving up

"Fame," long and lean, was second across the finish line in the 1930 Bermuda Race

the Maine coast idea during another flurry of hard luck off Newburyport, and sending the determined brother on to his rendezvous by train, the remaining three of us spent several weeks "doing" the area between Cape Ann and Cape Cod. *Mercedes* was no yacht, even if she did get a card from the hospitable Corinthian Yacht Club at Marblehead, and we three looked more like bums than gentlemen, but I still believe that the best way to know the fascinating ports of that storied section of our coast is to visit them as we then did.

With provisions, and the extraordinary expenses involved in our reconditioning at the Vineyard together aggregating about $210., the cost of the entire trip that year was approximately $500., or $125. apiece. Forgotten items might increase that figure to $150., but even that is cheap enough considering the value received.

In 1928 we did not put *Mercedes* overboard, sailing instead as working guests on one of the large schooners in the Bermuda Race. The education we received during that passage in what not to do in an ocean race was the seed from which grew, a year and a half later, our determination to enter a boat of our own (even if merely chartered) in the next Bermuda Race.

The summer of 1929 once more saw the *Mercedes* back in the water, this time with a brand new suit of sails which were made for us by a firm on South Street — and which, though fitting perfectly and of the best material, cost exactly $120.! Our cruise that year came under the same category as the 1927 venture, except that in 1929 we had but three weeks' vacation. Consequently, we hurried down east to the Vineyard, from where we set out to spend the bulk of our precious time cruising Nantucket Sound and visiting the harbors of the Cape as far east as Provincetown. *Mercedes* was overboard that year from late in April till mid-November, however, so we naturally sailed her constantly in the evenings and over week-ends both before and long after our vacation trip.

It is impossible to arrive at an exact figure of that summer's expenses, for the simple reason that I have no record of the small items involved in the frequent use of the boat in home waters, but I doubt if the following estimate is far off. Sails and yard bills, allowing for incidentals, were approximately $250., with the cruise adding another hundred. On top of that were such items as a $30. mooring rental, $40. for miscellaneous gear, and probably another $50. for tips and the like, spent for odd jobs requiring outside help. Add to those amounts a rather generous $150. extra for week-end supplies, and you have a grand total of $620. for the entire summer. And even if that were underestimating by $100., which I'm sure it's not, the total cost for each of the three of us was only $240. — for almost seven months of sailing. During the winter which followed, *Mercedes* was sold.

Our next venture in the nautical line took on added significance in view of the approaching Bermuda Race. It was in December, 1929, that Tom and I decided to enter a boat of our own, so to speak, in the 1930 race, rather than chance a repetition of our near fiasco of two years previous. That decision brought up two big problems, of course — a boat suitable in seaworthiness and speed for the purpose, and the immediate collection of a syndicate to assist in the sailing and financing of her.

In the solution of the first problem we encountered many difficulties. Finally, however, some time in February, after months of fruitless search, the schooner *Fame*, designed by Crowninshield, was mentioned. We had to go to Marblehead to see her, and although four years "on the beach" had dimmed her surface beauty, one view of the sweet line of her hull was enough. Long and lean, she looked fast even in her cradle, with her four-year-old paint hanging in strips and her spritless stem unceremoniously crowded out over the street. After a month of dickering with her owner in Porto Rico, we chartered her for two and a half months, with the agreement that he would have her commissioned for us by the first of May.

With *Fame* as selling talk, the task of completing the collection of our syndicate became much easier. Our original nucleus already included, besides Tom, Gordon and myself, three young veteran sailors, Jack Brooks, Jack Dickerson and Jack Lewis. Frederick Powers, then owner of the schooner *Buccaneer*, consented to be our navigator and brought with him another applicant in the person of Stuart Powers. Blake Willcox and Wallace Jordan completed the working personnel, so we crowned the venture by inducing Bowdoin Crowninshield, designer of *Fame* and half-a-thousand other fine boats, to be our skipper.

We had *Fame* at Greenwich for seven weeks before the race, and although we sailed her enough during that time to become thoroughly accustomed to her, we devoted most of the first month to the very hard work of getting her in shape for ocean work. We *did* "blow" ourselves to a paid hand, but no one man could have had her ready for sea in ten years. There was endless painting to be done, running rigging to be spliced and rove off, standing rigging to be adjusted, lifeline stanchions to be made and set up, carpentry jobs galore, a gallows frame to be made, provisions to be purchased and stowed, and literally thousands of incidentals to be collected. Of course, we all had our own personal businesses to attend to, but by detailing specific tasks to each man, and working nights and week-ends, we eventually had *Fame* in fair shape for her coming test and could begin to spend more time sailing her.

In the Rye-to-New London Race, just prior to the Bermuda run, *Fame* had the conditions that suited her best, and hung up a record that is likely to stand for a while. With a fine breeze on her starboard quarter, she reeled off those 80-odd miles in 9 hours and 23 minutes, finishing at 2:43 A.M., exactly 50 minutes ahead of the second boat.

In the Bermuda Race, *Fame* got away to a good start in a light breeze, and shook off all but about seven of her opponents before Montauk Point was abeam. Then she settled down to the business of trying to get by such stern stuff as *Lion's Whelp*, *Rugosa*, *Mistress*, and *Viking*. *Yankee Girl*, then far behind in the ruck, was completely forgotten, and indeed never again entered our thoughts until four days later.

With another ideal breeze on her starboard quarter, *Fame* clipped off a neat 209 miles during the first noon-to-noon run, and led the fleet. At nightfall of the second day, however, with only two boats in view, to starboard, she nosed into a soft spot among six successive waterspouts, and at sunrise four sails were in sight astern. They dropped below the horizon when the breeze came in, but the night of slatting, with no appreciable headway made, had shaken our sense of security. That second 24-hour run was only 111 miles, and although we did 172 the next day to total 492 in 72 hours, we were still pessimistic. After all, being scratch boat, we couldn't afford to waste a minute.

The morning of the last day dawned gray and wet, and our feelings were not helped by the presence of a big sail, later identified as *Lion's Whelp*, astern. A lucky eight o'clock sight revealed our position as nine miles from the finish line, as well as the fact that during the night an unexpected current had set us seven miles to

leeward! An hour later, with Bermuda finally in view through the drizzle, we spotted a white can buoy to weather of us and nearer the finish line — where no such object showed on the chart. That "buoy," under full sail, was doing about seven knots, and happened to be our old friend *Yankee Girl*, imbued with the very natural desire to be the first boat in! She was, and led us by a good half-hour; for while we were hacking up against the wind, making up for our leeward set, she, more to the westward, laid the line on one board. So that was that!

The expense of carrying a 66-foot schooner for two and one-half months, with a paid hand and the extraordinary costs incident to outfitting for an ocean race, was naturally higher than our average for former summers. The charter price, plus the additional heavy outfitting which we had agreed to assume, totaled $2900. A man for two and one-half months cost $350.; provisions, a like amount; extra yard work, $125.; and incidentals close to $200. That aggregates, roughly, $4,000., or about $365. apiece. That seems like a stiff figure in these times, but remember that it meant a large boat for half the summer, with a unique vacation thrown in; and that, due to these same hard times, it could probably be duplicated this year for little more than one-half that amount.

Shooting the sun from the deck of "Fame" under ideal conditions in the Bermuda Race

As pleasant as that venture with *Fame* was, our trip in 1931 was even more enjoyable, at least from the standpoint of cruising. Tom and I still possessed our as yet unsatisfied desire to see something of the Maine coast, yet our time was definitely limited to the customary two weeks' vacation. That meant acquiring a relatively fast boat, and a boat that would not have to run for cover at every threat of bad weather. If we were to see anything of Maine we couldn't afford to take our time getting there.

The boat we were fortunate enough to get for our purpose was *Carlsark*, the reputation of which as an able cruiser had been definitely established by three Transatlantic passages and a two-way trip through the Mediterranean. Following her return from the voyage to Greece, the rig was changed from ketch to jib-headed sloop. With her abundant light sails, she was ideally suited to our needs. In fact, she represented cruising luxury to us, accustomed as we were to the slowness and very limited accommodations of the old *Mercedes*.

"Carlsark," running before the wind, made a fast run across the Gulf of Maine from Cape Cod

Five of us were in on this charter, by which we had *Carlsark* for a month and a half, from the first day of July till the middle of August; and as our cruise did not start until late July, we had ample opportunity to use her in the Sound beforehand. The cruise itself, while only two and one-half weeks in duration, was nearly perfect from the point of view of boat and weather. And because of its unusual charm I shall describe it, briefly, as an example of what anyone else who so desires can duplicate this coming summer.

On Friday, July 24th, Jack Lewis, Walter Taylor and I cleared *Carlsark's* mooring in Greenwich Harbor and headed east before a gentle W.N.W. land breeze. At 6:30 that evening we picked up Tom in New London, and four hours later were again on our way towards far horizons. On Sunday, the fifth and final member of our party, Kingsley Jarvis of Toronto, joined us at Martha's Vineyard, and that night we cleared for Maine.

We left the Vineyard at nine o'clock, heading out across Nantucket Sound before a fresh S.W. breeze into a gorgeous rising moon. At three in the morning, on the slack of the tide, we entered Pollock Rip Slue, and in another hour, with the ocean once more beneath our keel, were running at a good seven knots along the outside forearm of Cape Cod. Just after breakfast we took our departure from the Peaked Hill Bar whistler, and with a fair sou'wester piping up astern, headed out across the Gulf of Maine for Seguin Island Light, distant 100 miles. That day's run, under fair skies and a favoring breeze, represents the cruiser's delight.

Shortly after sunset the breeze shifted into the northwest, and at midnight, when Tom roused out Jack and me to take over, the pungent odor of pine trees announced the near presence of our objective, further proof of which was offered by the gleam of Seguin Light some ten miles dead ahead.

We put into Boothbay that morning, once the sun had dissipated the water fog, and after cleaning ship went in to see the town. That

(Cont. on page 104)

Photo by courtesy of Lieut. Francis

DRIVING HARD!

The yawl "Ilex" in the Fastnet Race. The Royal Engineers who sail her have the reputation of sparing neither crew nor ship

The Parachute Spinnaker

A Solution of the Problem of How to Carry a Larger Spinnaker with a Shorter Boom

By DR. MANFRED CURRY

ALTHOUGH mainsails and jibs on yachts have undergone many changes in the last years, the shape of the spinnaker has remained unaltered. Practically all English or American spinnakers are made with parallel strips of cloth running either vertically or horizontally. (See sketches No. 1, 2 and 3.)

Cut in this manner the sail bellies out more or less according to the strength of the wind, and its size is determined by the length of the spinnaker boom. This boom, on the other hand, conforms to the measurements of the jib triangle, *i.e.*, its length bears a fixed relation to the distance between the mast and the point where the jib stay touches the deck. Now, in modern boats the latest aerodynamic experiments have resulted in a shortening of the base of this fore triangle. This, in turn, has caused the spinnaker boom to be shortened by almost fifty percent.

This tendency has resulted in the desire to find some method of still using a large spinnaker in spite of short spinnaker booms, and is the direct cause of the development of the parachute and funnel spinnakers.

It was as early as 1925 that I first tried using a

Left. A parachute spinnaker which solves the problem of getting a large sail with the short spinnaker booms prescribed by the rules where the base of the fore triangle is short

Right. A parachute spinnaker on a 20-Square-Metre racer. It is effectively spilling the wind into a light, overlapping jib

spinnaker from a larger yacht on my little racers. I cut this big sail in two at half its height, discarded the upper part, and shirred the cut edge of the lower part. In the very first regatta my competitors were unable to keep up with me on the course before the wind. But in very light breezes this spinnaker hung as limp as a nightshirt, as it was too heavy for the wind.

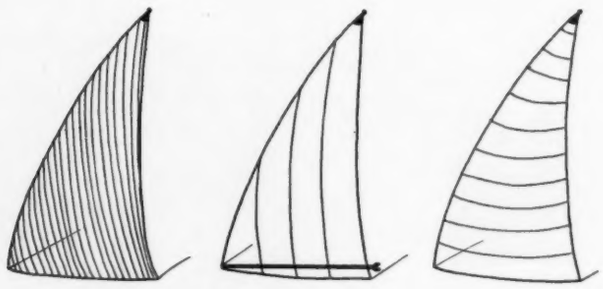
In Germany, this idea was immediately taken up by the sailmaker who made my sails, and we improved the spinnaker by replacing the folds caused by shirring with spindle-shaped breadths of canvas. These meet in one point at the top, whereas they only approach one another at the foot of the sail. In order to make the head of the sail spread, a broad strip of wood or light metal takes the place of the small wooden block used universally today except in Germany. (See sketch No. 6.) The spindle-like cut of the canvas breadths produces a sail similar to a parachute, with a relatively short base. This is the solution to the problem of how to carry, with a short boom, a spinnaker formerly carried with a boom twice as long. (See sketch No. 5, with the corresponding spinnaker boom beneath it.) In other words, one can now carry a spinnaker almost twice as large as those formerly carried, with a boom of equal length. By using as light a material as possible the parachute-like opening and ballooning of these new sails is facilitated.

Even a light wind inflates this sail like a balloon, and it is easy to tell from afar which boats are using a parachute, and which a normal spinnaker. The former are much larger and swell in the slightest breeze, while the old-fashioned small spinnakers hang limp.

It is high time that Americans adopt this innovation, which has been thoroughly tried out and introduced on all German yachts, both large and small. Otherwise, boats from the other side of the Atlantic may experience an unpleasant surprise in foreign waters when running before the wind.

One firm of American sailmakers, at City Island, has been coöperating in my experiments and has assisted me most energetically in improving this new type of spinnaker, and has adopted my idea of using the very lightest canvas. In the case of spinnakers for the larger yachts this is possible only by *reinforcing the light weight material with a netlike construction*, thereby obtaining an unusually light and at the same time strong enough sail to be of use in the larger sizes. The reinforcement can be woven into the material in the form of squares, or can be applied to the points of greatest pressure on the different parts of the sail. This idea (a patent for which I have applied) is absolutely new and is as yet unknown in Germany.

I may mention, also, that there is a way of improving an old spinnaker which is too large and heavy for a light wind and therefore flops about the deck or drags in the water, but which, on the other hand, fills out in a strong wind, under which conditions it might be even larger. A second hauling point (see sketch No. 7) is fastened in the head of the sail at a point which makes it the right height for a very light breeze. By this means one can hoist the sail in the normal way at the upper hauling point in a strong wind (making use of the full sail area), and in a light wind haul it up at the second lower point, thus reducing its size and preventing it from collapsing and dragging in the water.



Figures 1, 2, 3. Normal methods of sewing cloths in spinnakers with the strips running vertically or horizontally

Figure 6. In the parachute spinnaker a broad strip of wood or light metal replaces the small wooden headboard

Figure 4. Old style triangular wood headboard for spinnaker

Figure 5. A parachute spinnaker, showing how it will fill and spread though only a small boom is used

Figure 7. Spinnaker, showing two hauling parts for reducing the size for very light breezes

The Skipjack

The Second of a Series on Some Distinctive American Types of Small Boats

By H. I. CHAPELLE

THE most popular hull form for cheap sailing yachts is the V-bottom, sometimes known as the "diamond-bottom," but more widely called the "skipjack." This type of hull is a direct descendant of the sharpie, and has some similarity in design. The skipjack is a natural development of the old Nonpareil sharpies of the early eighties, and was developed to permit the use of greater displacement than was desirable in the Nonpareil type of hull. The V-bottom hull had a limited popularity on Long Island Sound, particularly in the vicinity of New London, Conn., in the eighties. Clapham had developed this type at the conclusion of the evolution of the Nonpareil sharpie. Why the type is called "Skipjack" is not evident, but the name was applied very early in its development.

It was on Chesapeake Bay, however, that the skipjack was most highly developed, and where it enjoyed the greatest popularity. The Chesapeake skipjack has always been given a fine reputation for speed and weatherliness, and is one of the most striking and distinctive of American small sailing boat types. The history of the type is still incomplete, but such evidence as could be found makes the following seem fairly accurate.

The New Haven type of sharpie was employed in the oyster business on the Bay in the early days, and it is possible that these boats were introduced from the Sound about 1868. However, the sharpie, while still used on the Bay, was never a very popular type there. The reason for this was that the distances to market on the Bay were greater, requiring a larger and more burdensome boat than was necessary on the Sound.

Except for this situation, the weather and water conditions on the Bay are like those on the Sound. Both bodies of water can be very rough and uncomfortable, and both are very shoal in places, particularly on the oyster beds. Thus the demand for light draft boats existed in both places. However, the Bay oystermen appear to have had a preference for the sloop rig in the early days; even in the log canoes this rig was popular.

At any rate, the early sloop-rigged and beamy sharpies on the Bay were given a little deadrise aft, to make them sail better, and this type became known as Hampton Flatties. Their rig was that of a gaff-rigged sloop, without a bowsprit. These boats were rarely over 30 feet in length, and had no cabin. Another type was also developed; these were called "Bateaux," and were small, narrow, flat-bottomed boats, leg-of-mutton sloop rigged; they were open boats, and most of them were double-enders. As the necessity for larger and more burdensome boats increased, the development of the skipjack from the Hampton Flattie was inevitable. This improvement must have taken place sometime in the early nineties, though the skipjack is not mentioned in print until much later.

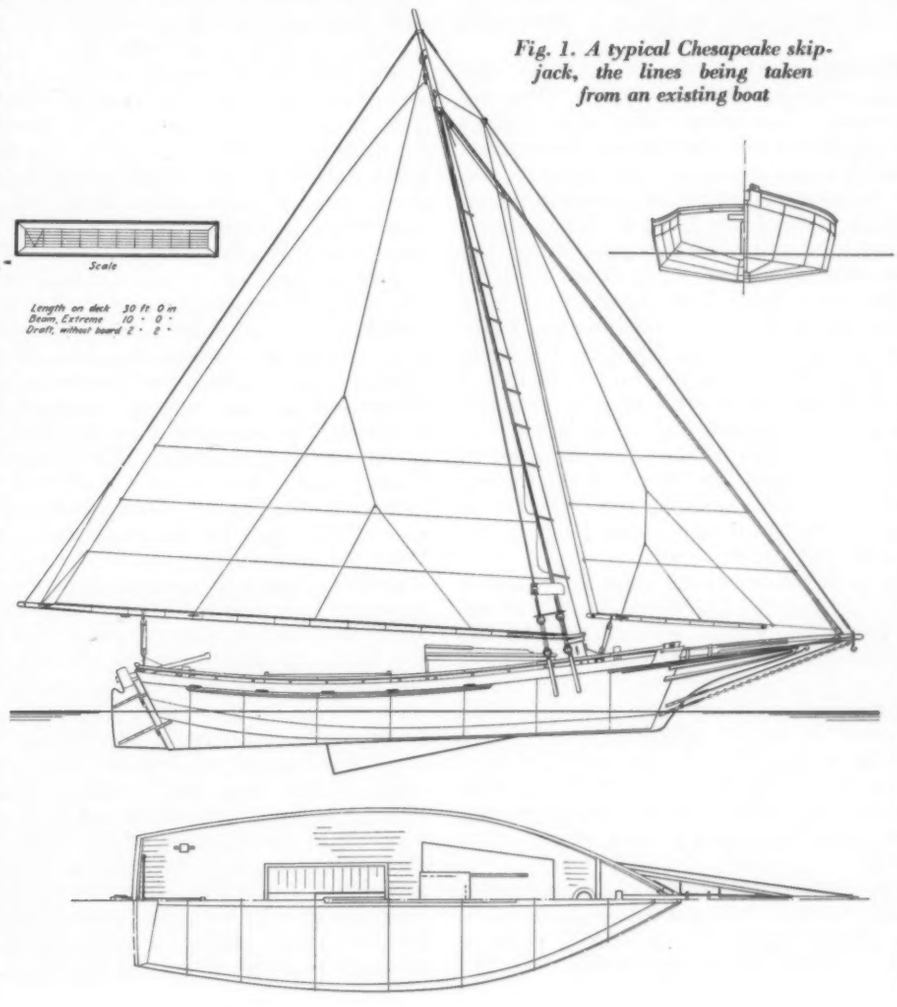
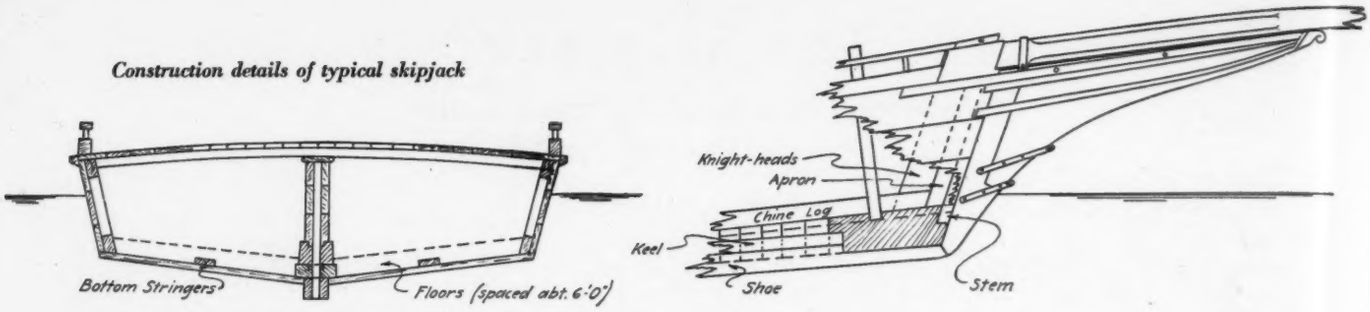


Fig. 1. A typical Chesapeake skipjack, the lines being taken from an existing boat

Skipjack yachts have been popular, not only with amateur designers and builders, but with professionals. The famous yawl, *Sea Bird*, in which Thomas Day crossed the Atlantic, is one of the best known of skipjack yachts, but she differs greatly from the Chesapeake model. Day's report on her qualities, as well as later reports on copies built on her lines, show that

Construction details of typical skipjack



pounding was not wholly overcome; it is apparently impossible to avoid this fault in the V-bottom hull. It seems likely that the seaworthiness of the model has been somewhat over-rated. However, the Bay skipjack has many excellent features and has been quite successful, while V-bottom sailing yachts have not been uniformly satisfactory. Many such yachts are slow and do not carry their sail as well as could be desired. A study of two fast sailing Chesapeake skipjacks seems to show the reasons for the lack of success of the V-bottom in yachts.

The skipjacks on the Bay vary in length from 28 to 60 feet, but all are built on the same rule of thumb proportions. The lines of two examples were taken off, one 38′ by 13′ by 4′; the other, 30′ by 10′ by 2′ 2″. Both were on a similar model, differing only in minor details. The larger boat had been built about 1898, for the oyster business; the smaller boat, of about the same date of build, was a farmer's boat. Because of their similarity, only the smaller skipjack is illustrated (Fig. 1).

Through the kindness of M. V. Brewington, Jr., the Bay rules for building skipjacks are available. They are as follows: The greatest beam is one-third of the length on deck, and is located between one-half and two-thirds of the length on deck abaft the stem. The width of the transom is about three-quarters of the greatest beam. The flare of the sides varies from 2″ to 3″ for each foot of depth amidships, according to the practice of the builder. The mast step is located one-fifth or one-sixth of the length on the water line, abaft the stem, varying somewhat with the size of the boat, and the mast rakes about 75 degrees to the l.w.l., the masthead coming directly over the point of greatest beam. The length of the mast is equal to the length on deck, plus the greatest beam. The length of the bowsprit, outboard, is equal to the greatest beam. The length of the boom is equal to the length of the hull on deck. The length of the centerboard is one-third the length on deck, and is placed in the middle third of the aforementioned length; the board does not appear above the deck.

Fig. 1 shows the peculiarities of the type. Attention is called to the following points: The chine, in side elevation, shows the same amount of straightness in the forward end as was seen in the sharpie. The rabbet of the bottom is a curve of the same character as the chine, and the run is long and flat; the deadrise is always small amidships. The chine is always submerged amidships and at the stem. The freeboard is always low amidships, but there is a strong sheer, which gives high ends, particularly forward. The low freeboard, sweeping sheer, and long cutwater, combined, give a very graceful appearance to the hull.

The long cutwater and the head rails are typical of nearly all of the Bay types, but the reason for them is not apparent, though the upper, or head rail, is useful as a place on which to stand when furling the jib. The bowsprit is secured by one or two gammoning irons, and by the characteristic knight-heads, as well as by the bitts. The stern varies; some boats have a transom, as in the figure, while others have overhang and an inboard rudder. Most of the skipjacks steer with a wheel, except in the smaller boats. In any case, the stem and transom are set with a strong rake, which seems to vary as the flare of the sides. If the stern has overhang, the quarters are quite thin, due to the height of the chine at the stern.

The open rails, supported by short pipe stanchions, through which bolts pass, are common. Like the sharpies, the skipjacks load aft, and so trim by the stern. The center of buoyancy is about amidships. The hull, 6 inches above and below the l.w.l., is sheathed with galvanized sheet steel, as ice protection. The centerboard is of the usual type; there is no special gear or construction. The lanyard is made fast to the case in the main hatch, as a rule. The pin is high in the case; the case supports the deck amidships, where the dredge winch is located in an oyster boat.

The deck arrangement varies, in accordance with the size of the boat and the trade in which she is employed. The house is most commonly forward, and usually contains two berths and a stove. There is often a wooden horse for the jib sheet, and sometimes one for the main sheet, too. A large main hatch, about amidships, is sometimes accompanied by a small hatch aft; if the house is aft, the small hatch is placed forward, of course.

Few skipjacks have more than two men as crew, and are often sailed single-handed; hence their rig is very simple and rather light. There are some peculiar features in it which are worth attention. The mast is of large diameter at the deck and tapers to a small head; it is supported by two shrouds on each side, set up with lanyards. The shrouds are quite slack, which allows the rig to be rather flexible. There are also two stays, a jibstay and a stay to the masthead. Both lead to the bowsprit; the jibstay, which, like the shrouds, does not run all the way to the masthead, passes through the bowsprit and thence to the cutwater. The masthead stay leads from a mast band aloft to another band on the bowsprit, to which the two bowsprit shrouds and a chain bobstay are also attached. The shrouds and stays are all of galvanized rigging wire. It is usual to take up the slack in the stays by hogging down the bowsprit with the chain bobstay and jibstay turnbuckles. The hook at the end of the bowsprit serves as a fairlead for the anchor cable, to clear the head gear and to prevent chafe. While this must bring a heavy strain on the bowsprit, it appears to do no harm. There is nothing unusual in the mainsail or jib, except that the head of the mainsail sets flying, and a peculiar fitting of the lazy-jacks of the jib. These are attached to a spectacle ring, which rides on the masthead stay and are raised or lowered with a halliard attached to the ring and reeving through a cheek block on the mast. A similar rig is

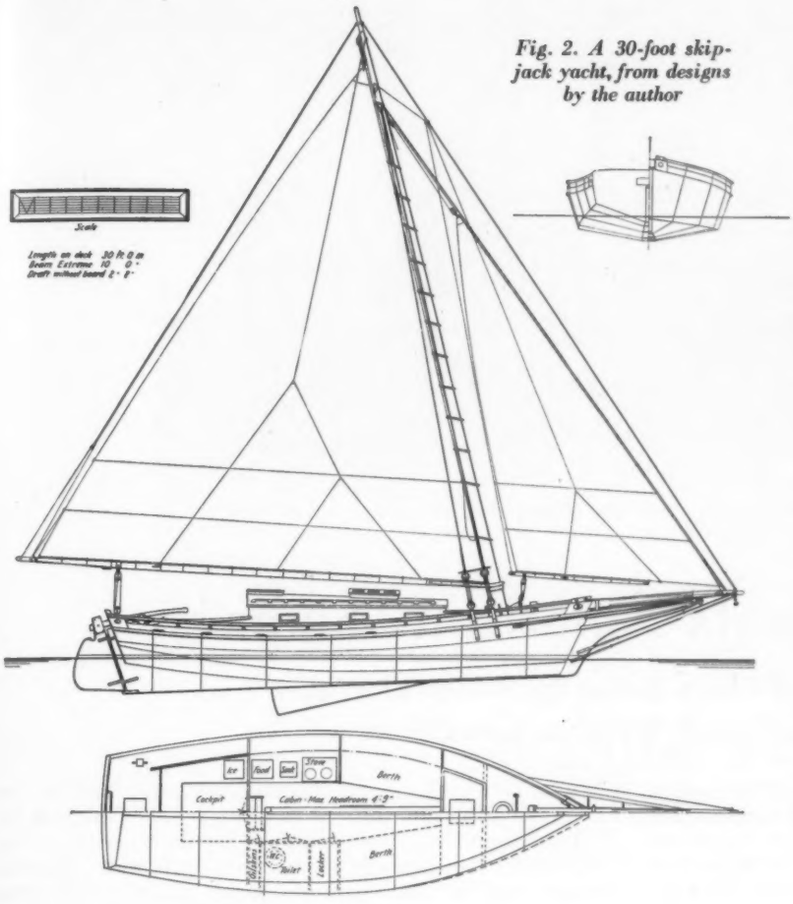


Fig. 2. A 30-foot skipjack yacht, from designs by the author

quality is sometimes observed in beamy yachts with the so-called "modern" jib-headed rig, when reefed down in strong winds, for this same reason. On the whole, the skipjack rig is an efficient one, considering area and cost.

The handling of the skipjack is an important matter. They are sailed well heeled to put them on their chine, whenever possible, so as to prevent pounding in rough water. It is only when upright or when running on their chines that the skipjack model does not pound. It is obvious that, at certain angles of heel, the hull is riding on a flat bottom, and pounding therefore is unavoidable in all V-bottom sailing hulls. The two advantages that the skipjack has over the sharpie are the eliminating of pounding when upright, particularly at anchor, and the possibility of employing greater displacement.

The construction of the skipjack is marked by economy in labor, materials and cost. In general, the construction of the skipjack is similar to that of the sharpie; the sides are strengthened by sheer battens and chine logs, the strakes are held together by cleats closely spaced, extending from sheer batten to chine log. The bottom is cross-planked. In old boats the planks are laid on at right angles to the keel, but in later boats the planks are laid at an angle of about 45 degrees, sloping

(*Continued on page 110*)

occasionally used on the mainsail, the ring riding on the toppinglift which in such case is of wire. The idea of this rig is to prevent fouling when the sails are being hoisted. The jib is fitted with a downhaul reeving through a cheek block on the bowsprit, and the mainsail is fitted with a reefing tackle, which reeves through a cheek block on the boom in the usual manner. The main boom toppinglift is made fast aloft, with a thimble in the lower end, through which a lanyard is rove. This passes through a cheek block on the boom.

The reason for the extreme rake of the mast is hard to discover. Probably, it is a matter of custom. It possesses two practical advantages, however, which seem to have importance. The first is that it permits the mast to be placed well forward, giving more usable deck space, which would otherwise be impossible in a leg-of-mutton sloop without the use of a tremendously long main boom. The other reason was discovered when calculating the center of effort; the center moved forward very little when the sails were reefed. Were the mast vertical, the movement of the center of effort forward would be great, and while this would not be a serious fault in a narrow boat, in a wide vessel it would cause excessive lee helm, and therefore hard steering. This

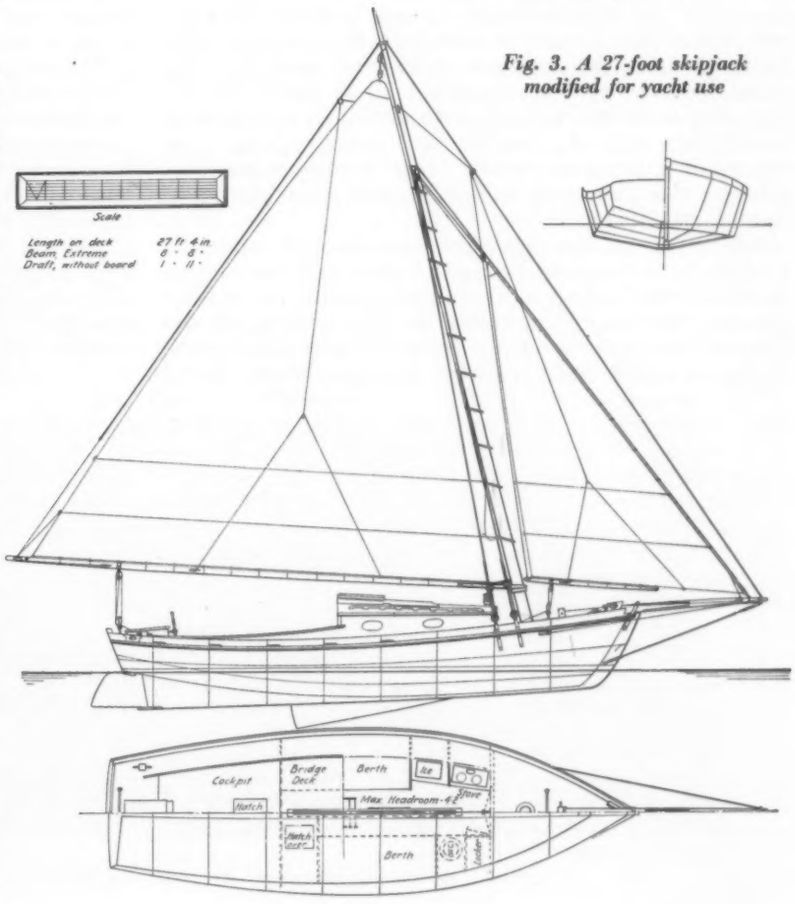
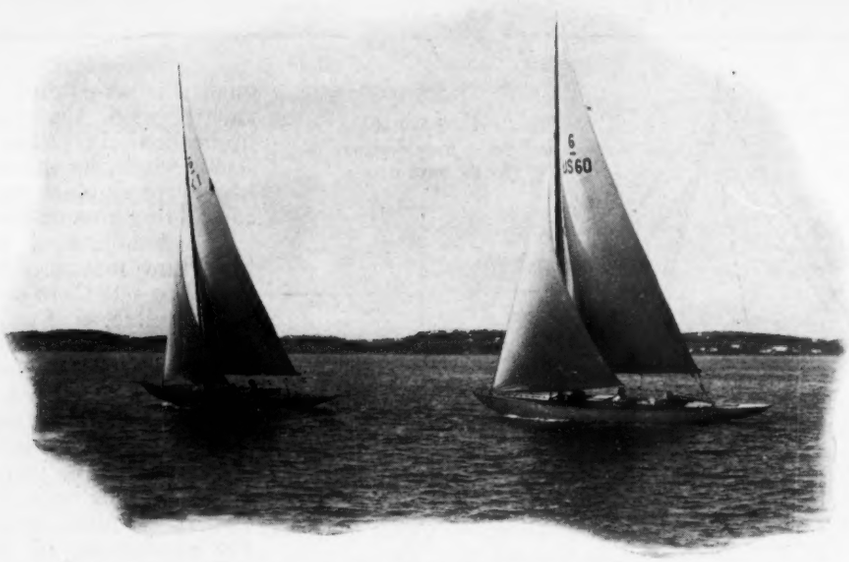


Fig. 3. A 27-foot skipjack modified for yacht use



"Viking" (left) and the new American Six-Metre "Nancy" turning to windward in light weather during the race for the Prince of Wales Trophy sailed at Bermuda

"Viking" Beats American "Sixes"

Six Yachts Sail Close Series for Prince of Wales Trophy in Varied Weather Conditions

FOR the past few years the American yacht racing season for Atlantic Coast yachtsmen has opened with the spring series at Bermuda, when the sailors from the "Onion Patch" do their best to show the American tars, who are lucky enough to make the trip, just how a boat should be sailed. In this praiseworthy desire the Bermudians were eminently successful this year, for they not only took the Long Island Sound Interclub team into camp for the first time in Bermuda waters, but with two local "Sixes" racing against four American Six-Metre yachts, they were successful in winning the Prince of Wales Trophy, first placed in competition this year.

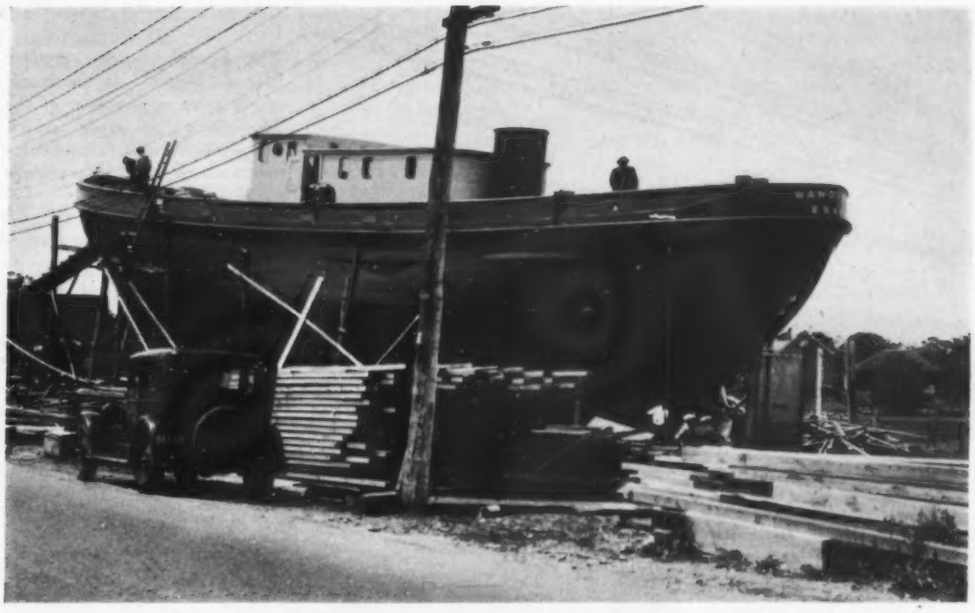
Inasmuch as the Bermuda one-designs and the Interclubs have met many times before, and the relative merits of the boats are pretty well known, the greater interest this year is centered in the meeting of the "Sixes," particularly as one of the American boats, the *Nancy*, is a new craft, built by the Seawanhaka Yacht Club to race in England this summer, and making her first appearance in this series. *Nancy* was designed by Olin J. Stephens, of Sparkman & Stephens, with a view to meeting the hard conditions usually found in British waters, and in the Bermuda series she showed great promise, although she did not win and had to be content with fourth place, this lowly position being due chiefly to an unfortunate foul, which caused her withdrawal in one race and the loss of all points. The winner of the series was the Bermudian *Viking*, owned by the Trimingham brothers and sailed by Eldon Trimingham, who has long been a hard nut to crack for Americans looking for sailing honors.

The Six-Metre series followed the Interclub-Bermuda one-design team match, and was sailed April 12th to 15th. Bermuda was represented by two of their Anker-designed "Sixes," built in 1929, the *Viking* and the *Achilles*, the latter sailed by J. E. Pearman. The four

(Continued on page 104)

Photos by Bermuda News Bureau

Start of the last day between the American and Bermuda "Sixes." "Lucie" first across



"Wanderer," 104 feet over all and Diesel-electric powered, in the J. F. James Shipyard at Essex, Mass., where she was built. Her design is an adaptation of German North Sea trawler lines to which the Maierform principle was first applied

"Wanderer"

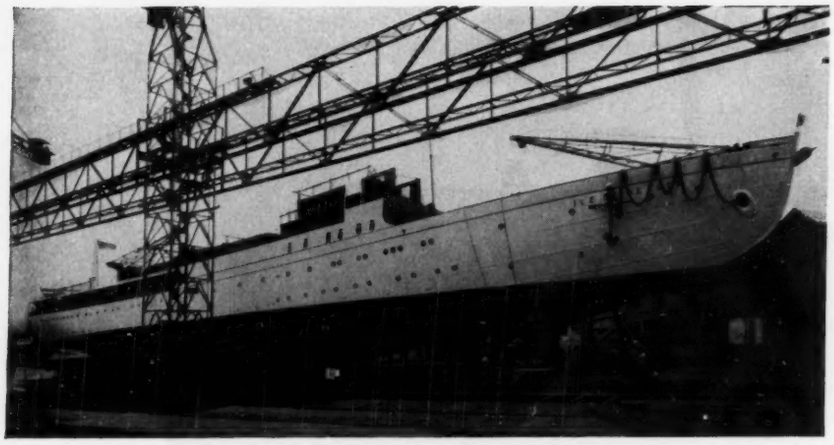
A Diesel-Electric Cruiser Built to the Maierform Principle

WANDERER is a unique cruiser and in many respects a pioneer ship. She is propelled with a submarine Diesel-electric drive and is the first yacht in America built to the Maierform principle. This type of propulsion system was specified because her owner, Mr. R. W. Allen, claims that there is no more need for an engineer in a cruiser's engine room than there is for a mechanic under the hood of an automobile. With Diesel-electric drive, complete control of the power plant is centered in the pilothouse, even including the starting and stopping of the Diesel motors. The Maierform type of hull construction and design was applied because *Wanderer* was built for extended offshore cruising, anywhere, under any conditions. She is a complete little seagoing vessel, right down to such a detail as being equipped with buckets made of monel metal.

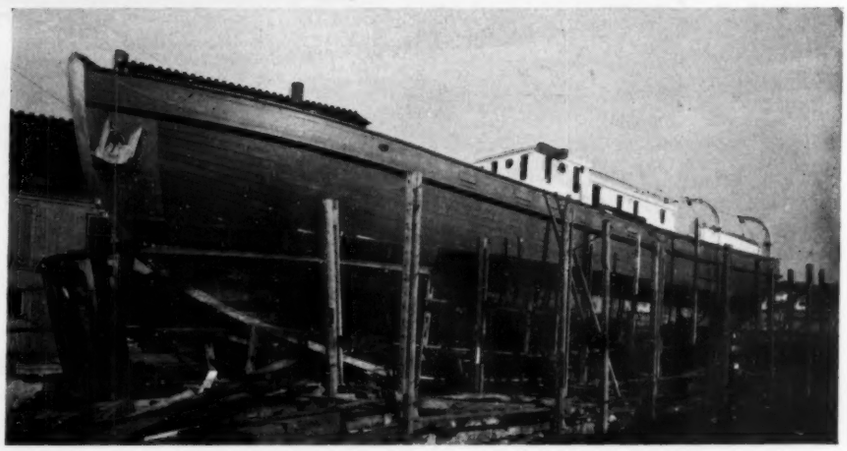
Wanderer is 104 feet overall, 23 feet beam, and 11 feet draft, and in general appearance resembles the North Sea power trawlers, which were the first vessels built to the Maierform principle. This type of hull form may be driven at higher speeds through rough seas — and smooth seas as well — with less power than a normal displacement hull. Decks remain drier and there is greater stability and maneuverability with a Maierform hull than with a normal hull. If all these statements be true — and reasonable proof will follow — then the Maierform principle is well worth the attention of yachtsmen.

This principle is a commercial development and the comparison given above with a normal hull form was for commercial vessels. However, yacht design, particularly where seaworthiness and service are prime considerations, often follows in the footsteps of hull design evolved by commercial usage. Witness the development of the Malabar type of schooner from the Grand Banks fishing schooners, and other comparisons of a similar nature. When the Royal Netherlands Steamship Co. docks a steamer to have her bow cut off and replaced by one built to the Maierform principle the resulting change must be considered advantageous to merit the cost of the alteration. What is applied to commercial vessels with advantage may be applied to yacht design. It must be remembered, however, that the Maierform principle applies only to displacement hulls of relatively low speed-length ratios, which does not include the modern cruising motor boat or runabout, but does apply particularly to larger Diesel or steam cruisers. Maierform lines are suited to sailing yachts, although it will be observed that the Maierform hull form is not unlike existing sail boat hulls.

The late Professor Maier, an Austrian naval architect, devoted his life to the development of a commercial hull form which, besides having a low resistance to movement through the water, could be driven at nearly full speed through heavy seas without damaging the vessel. In tank tests conducted over a period of years Professor Maier discovered that the water particles, in passing along the hull of a normal ship form, traveled in an irregular waving course, or, in other words, did not follow the line of shortest distance between the points where the particles first came in contact with the hull and finally left the hull surface. Therefore, each individual particle of water created more skin friction than was necessary because it rubbed over a greater length of hull surface than necessary. Like a ship steering an irregular course between two points, power was wasted. This, however, does not infer that the water



The French express cruiser "Ile de Beauté" is the result of the pure application of the Maierform principle which has produced a handsome commercial vessel with lines worthy of a yacht



"Wanderer's" bow, showing the influence of the Maierform principle in developing a cut-away forefoot and V-shaped sections

particles must travel in straight lines. They follow ribband lines of the shortest distance around the hull in the same manner that a ship steers a great circle course over the curved surface of the earth. In short, the Maierform principle produces a hull form around which the particles of water travel the shortest possible distance and, therefore, the skin friction is reduced to its minimum.

The model testing eventually developed a form which satisfied the above conditions and resulted in a triangular shaped forebody with parallel sections sloping at about 45 degrees to the centerline. The accompanying photographs of the *Wanderer* and the express steamer *Ile de Beauté* illustrate the resulting form and show the similarity to sail boat hull forms, particularly double-enders. It was also predicted that this type of forebody, with the triangular entrance, would have less resistance to waves than the normal form and that it would prevent solid water from coming on deck because of the flaring bow. These later characteristics could only be proved with full-sized vessels in actual conditions, so two boats were built with which to conduct comparative tests.

Two 35-foot boats were built, 1 to 4 scale reproductions of North Sea trawlers; one with the lines of the latest conventional trawler, and the other on Maierform lines. Each was equipped with the same power. The first test was made in smooth water with the engines running at 1,000 r.p.m. The Maierform boat left the normal form boat far behind over a measured mile and it was necessary to turn up the revolutions to 1,200 in the normal form boat in order to keep her abreast of the Maierform boat. Then the two boats were run out in the open sea and the normal form boat was left still farther astern. These comparative tests of the two boats of equal displacement were conducted in all sorts of sea and weather conditions and the overall result showed that the average decrease in resistance was from 8 to 10 percent. The success of these experiments justified the building of numerous trawlers on Maierform lines. In comparative performance tests the new trawlers showed a gain of 25 percent. The model tests showed a decrease in resistance of only 14 percent, so the added gain with the full-sized boats must be explained by an increase of seaworthiness and a smaller loss of speed in heavy seas and under actual service conditions. With this proof, larger vessels were built to Maierform lines and it is said that if the third sister ship to the *Bremen* and *Europa*, which was planned, had been built she would have been designed according to Maierform principles. There are 30 Maier ships in service today.

It was on the strength of the foregoing proof that *Wanderer* was built to Maierform lines. Her owner wanted her more for hard usage than for good looks, so she is not as handsome as she might have been. However, one look at the photograph of the French express steamer *Ile de Beauté* shows that the Maierform lines can produce a handsome and sweet-lined vessel. In fact, this steamer looks more like a yacht than a commercial vessel. Often the simple and fundamental laws of nature force man-made design to develop forms of greater beauty than he would otherwise create to suit his own eye. Air resistance has caused engineers to design better looking automobiles and airplanes than were first built without a complete knowledge of aerodynamics. This effect of natural laws is particularly noticeable in the development of sailing craft. We have seen, in recent years, the sorry result of man-made restrictions causing ugly designs with sawed-off sterns and the like. If the laws of nature are allowed to take their course and designs are built to follow only the demands of these natural laws the resulting form will have a beauty of purpose that surpasses man's originality. The Maierform principle, in its conformity to natural laws, has produced a handsome vessel in the French express cruiser, and she may be taken as a criterion because cargo space was not a necessary consideration. And here we have an example of the influence of the natural laws of hydraulics in creating a thing of beauty.

Wanderer's power plant and interior equipment are equally as interesting as her hull form. The Diesel-electric drive was designed and installed by the Elliot Company, makers of submarine Diesel-electric propulsion systems, the Diesel motors being two De La Vergnes with a rating of 300 h.p. at 750 r.p.m. The two Diesel motors are direct connected to 200 kilowatt generators and 50 kilowatt auxiliary generators and these units are mounted on each side of the electric propulsion motor which supplies the shaft with 400 h.p. The electrical system provides variable voltage control of each armature of the propulsion motor, which permits of smooth acceleration, rapid reversing and remote control. By pressing a button in the pilothouse each operation can be controlled through a five-panel switchboard in the engine room. The speed is controlled by a vertical handle moving in a fore and aft direction and actuating two groups of rheostats connected with the armature and field of the propelling motor. When the lever is pushed forward or backward polarity contacts come into action and determine the direction of rotation of the motor. In addition to the master controller in the pilothouse, there are control push button stations, speed indicators, manual and automatic steering devices, oil gauges, ammeters, a Sperry Gyroscope and recording instruments. In connection with the control system is a complete and elaborate system of siren alarms in the pilothouse which sound a warning if there is overheating, failure of oil and water pressure.

The deck arrangement and interior layout, with their fixtures and fittings, are remarkably simple and therefore serviceable. There are no ports and the quarters below are entirely ventilated and illuminated artificially. Forward are the quarters for the crew which are reached from the deck through a companionway protected by a heavy steel booby hatch. Next aft is a spacious galley equipped entirely in monel metal with electric refrigerators and electric stove. Abaft the galley are the owner's quarters which are attractively but simply decorated. In the after end of the deckhouse is located the battery room which contains a large battery installation containing 56 Ironclad Exide cells.

Wanderer was launched from the J. F. James Shipyard, at Essex, Mass., last fall. She has a cruising speed of 13 knots, which gives her a radius of 10,000 miles. With her heavily built hull and complete power plant, *Wanderer* should prove equal to any test of weather and make an ideal round-the-world cruiser.

The fore deck and interior views of "Wanderer" bear evidence of the simplicity and practicability of her layout. The heavy steel booby hatch on the fore deck protects the companionway leading to the crew's quarters. The galley, with its electric stove, is complete in detail and finished entirely in monel metal. The after end of the pilothouse provides lounging quarters and a chart table handy to the wheel forward. Looking forward in the pilothouse there is the Sperry Gyro compass with repeater over the wheel, and all the controls near at hand

International Dinghies—So Called?

By G. ERNEST MACRAE

IT WAS with very genuine pleasure that your many Canadian subscribers read in the February issue of YACHTING the article by John S. Barnes on what he calls the "International" Dinghies. He evidently loves the sport of small boat racing and knows whereof he writes. May I go a little further than Mr. Barnes does, and mention one or two things, which from the Canadian point of view, at least, should not be overlooked, and, for some reason, were quite ignored?

In Toronto, where the art of small boat construction and the sailing of the 14-foot dinghy has become a science, we have one outstanding designer, amateur at that, to whom, in common fairness, unreserved credit should be given. International dinghy races on Lake Ontario, or local contests, owe their position to Charles W. Bourke, of Toronto, whose drawing skill and keen knowledge of actual racing requirements have been placed at the disposal of all who are interested. It is Bourke's great gift to be able to put into designs what personal experience in actual racing conditions tell him is needed. It is a rare gift, and the result is that his boats outrank competition, and have made Toronto and Lake Ontario "the recognized home of the finest racing skippers and the fastest 14-foot dinghies on salt or fresh water." It was C. D. Mallory, President of the N. A. Y. R. U., who paid this fine tribute. To back his opinion, he owns one of the Bourke boats.

Bourke does not agree with what Barnes says in connection with the use of the divided sail plan. The latter dismisses this most important experiment as follows: "Both classes carry a mainsail of only 140 square feet. This sail plan is, I think, preferable to the jib and mainsail in a boat of this size. A skipper and crew of one is kept pretty busy handling the sheet and the centerboard, which take continual shifting when racing. I also question the efficiency of a sail as small as the jib would be on a dinghy. Therefore, the added cost would hardly be justified."

Bourke has gone very fully into the jib and mainsail plan with Chris Ratsey and others. Its use in British waters is common and it is now also being tried out in the States. Its great and chief advantage is that the drag on the helm going down the wind when it is blowing is done away with almost entirely, and that the division of the limited sail area affords a much better balance and is easier on the skipper. On the wind, also, speed is not affected at all; if anything, it is improved.

Using the single sail, these 14-foot boats are the devil to hold in a seaway. There is too much pressure aft, and in dead-down-the-wind runs the only method is to "beat to leeward," as you Americans so aptly term it. It is felt that with the sail reduced by the amount that goes into the jib, whatever that may figure, this pressure, by consequent distribution of balance, will offset this trouble. Anyway, we won't be surprised to see it in use this summer up here in Canadian waters.

At the annual meeting of the Lake Sailing Skiff Association, which is the governing body on Lake Ontario of small boat interests, held in Toronto in January, it was decided to do away with metal masts, "gybing" centerboards or rudders, and to limit the lateral area of plank booms to six square feet. It was felt that the experimentation period was, perhaps, going too far, and that a curb should be put upon it. Also, a committee was appointed to report upon the advisability of a standard type of boat for the benefit of the more conservative small boat sailors.

On the Canadian side of Lake Ontario the 14-foot dinghy has developed into an out-and-out racing proposition, and the Bourke boats are beyond doubt the "last word." Notwithstanding the limit put on gadgets of one kind or another, this speed race will continue. It might be wise, perhaps, to let those who wish to do so carry on within those restrictions as they are, and for those who may wish a more substantial craft, to formulate restrictions for such a class and make known at once the findings of an appointed committee.

In this connection, would it not be well for Mr. Barnes and his Henderson Harbor yachtsmen to get in touch with the secretary of the L. S. S. A. and find out just what will be called for in the new standard type? Henderson Harbor is a Lake Ontario port, and it will add value to their boats if they comply to the qualifications and specifications of the Association. The measurement rule that these boats must comply with at the present time is: 14′ over all; 5′ 7½″ extreme beam; 16″ minimum depth of hull; area of largest cross section, 875 square inches; sail area 140 square feet.

I do not know where Mr. Barnes got the name "International" dinghies for the boats he describes. International, to us, has meant competition with foreign-designed boats, and, so far, Rochester, New York, has been the place that has forced the racing on Lake Ontario and done its share in the competition for supremacy, keeping pace with the

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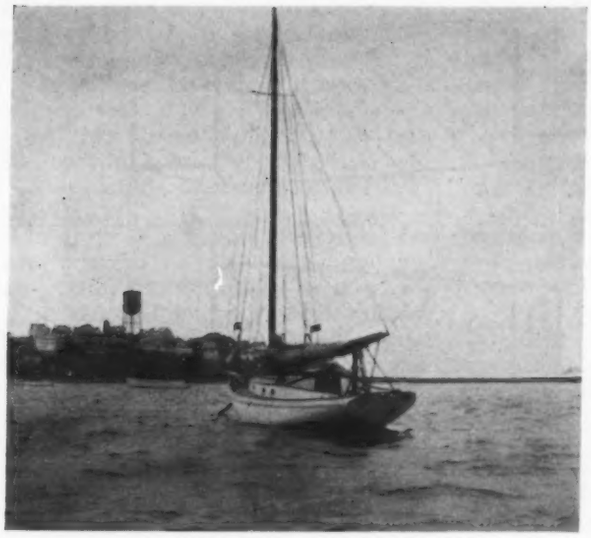
The Royal Canadian Yacht Club 14-foot dinghies, designed by C. W. Bourke, are highly developed racing craft



A short after overhang may be made into a handsome stern if the upper part of the transom is rolled home

A Small Single-Handed Cruiser

By

RALPH E. WINSLOW

IN GETTING up the design of this small single-handed cruiser for YACHTING, I have kept in mind the thought that in times such as these the first cost must be kept to a minimum, as well as the cost of upkeep. This means, therefore, small dimensions and as much boat as possible on the selected minimum length. The accompanying plans are the result of 27 years of cruising experience in small sailing and auxiliary yachts, ranging from a 16-foot waterline knockabout to my last three cruisers, *Tamar I*, 37 feet long, *Tamar II*, 34 feet 4 inches, and *Tamar III*, a 31½-footer built last year. All were from my own design.

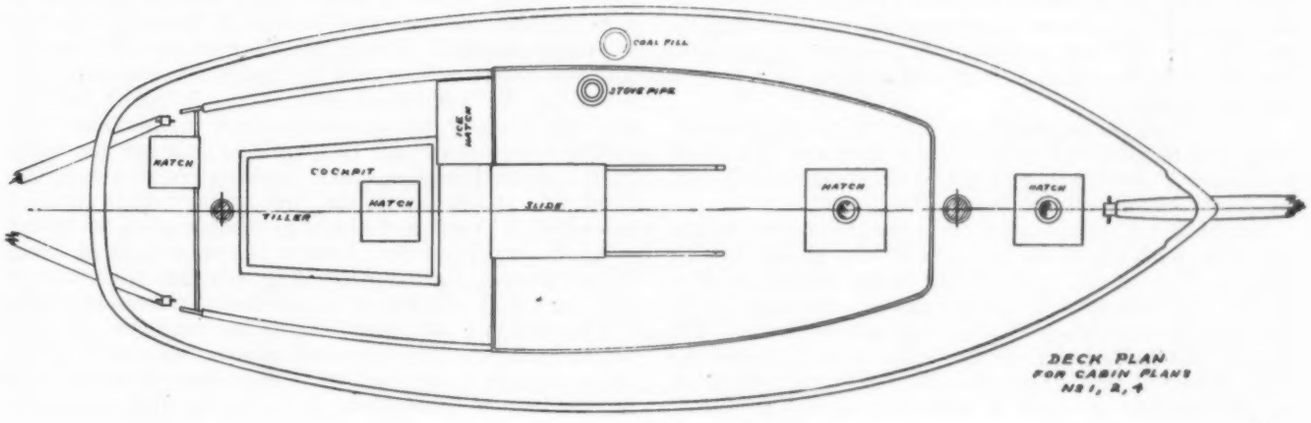
I believe that a boat which is to be sailed single-handed must be extremely seaworthy. She must be small enough so that her weight, area of sails and size of anchors do not call for extraordinary physical strength. The anchor should not weigh more than 40 pounds for the ordinary hook and 60 pounds for the heavy anchor, as the single-hander must be able to handle his ground tackle fast and has no time to winch an anchor in slowly. When the anchor is broken out it must be gotten clear and up on to the bowsprit, or on deck, quickly, or else the boat may drag ashore or foul other boats before one has time to get underway.

The hull should be as burdensome as possible, yet without too great weight, and the waterline should be long, for length means speed, seaworthiness, and tends to prevent excessive pitching. Stability should be great, as ability to carry sail may be absolutely necessary if caught on a lee shore short-handed. I know of nothing so nerve wracking as a boat that is quickly overpowered and has not the ability to work to windward when caught in such a predicament with an increasing wind and sea.

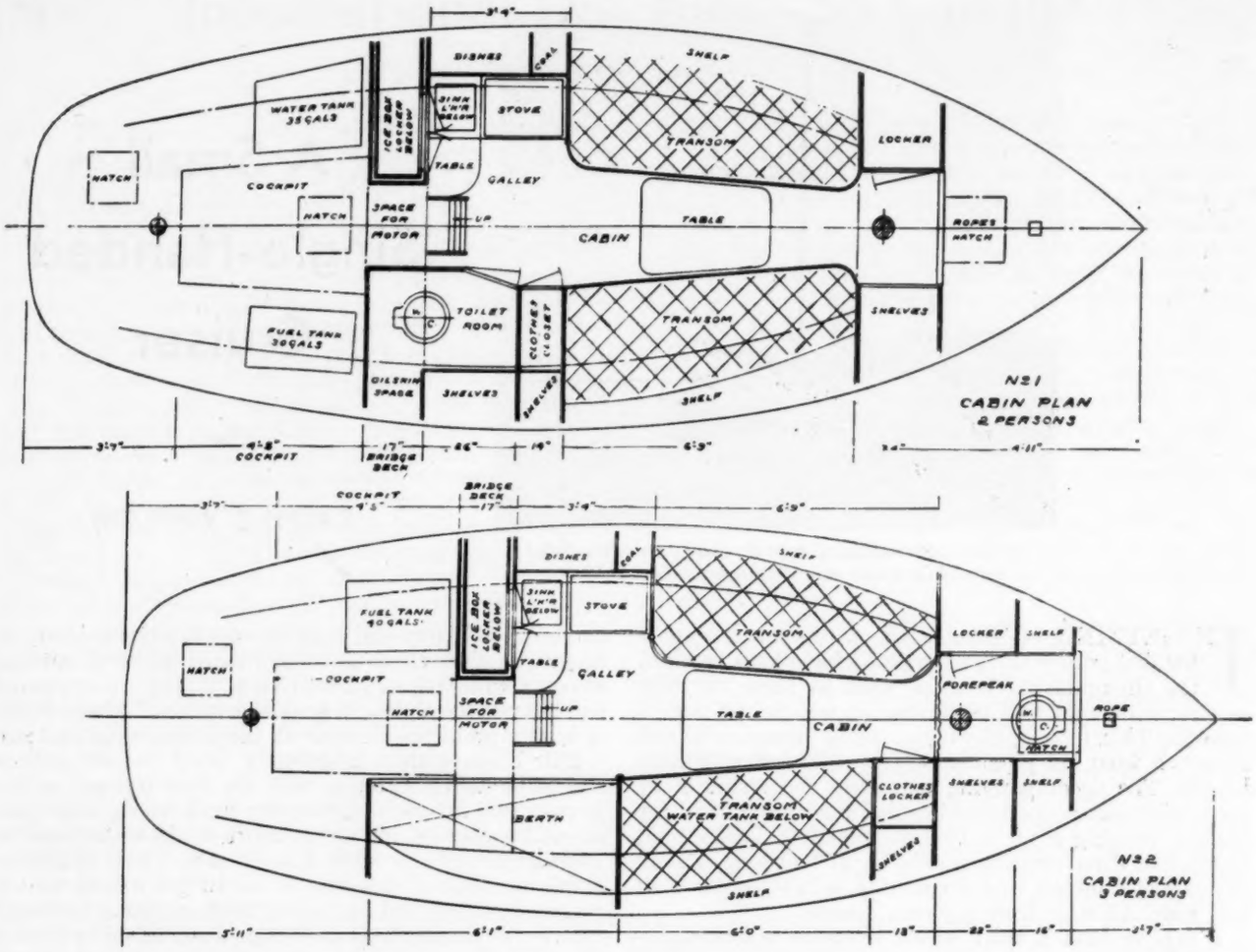
Fair beam with a moderately hard and deep bilge should be incorporated so that the boat will sail on her bottom and not heel in ordinary fresh winds more than about 20 degrees, for the comfort of the crew must be considered and the cabin kept livable. There should be a fair amount of deadrise so as to get a hull that is reasonably deep and not on top of the water, a moderate "S" in the garboards to hold bilge water in the bottom of the boat and raise the center of buoyancy, which will add to the stability. Forward, the forefoot should be deep and sharp. The overhang at the bow should be short, but sufficient, so that the hull will have some reserve or surplus buoyancy to prevent deep pitching, but not enough so that the bows are so full as to give undue head resistance when going to windward in a sea.

I would prefer a slight hollow in the waterline forward so as to give an easy entrance, and I believe this, combined with the proper amount of flare and freeboard, will make a dry boat and add windward ability.

Aft, the overhang should be fairly short, but long enough so that there is room properly to step the mizzenmast if a yawl rig is used, and give some room to handle this sail; or, if a sloop or cutter rig is used, that



DECK PLAN FOR CABIN PLANS NOS 1, 2, 4



the first reef is within easy reach of the deck. The sections aft should have a fair amount of deadrise and the upper part of the stern transom should be rolled home to prevent damage to the rails and to keep the sheet from fouling the corners of the stern. This makes a very handsome stern transom for a short overhang, as may be seen from the photo of *Tamar III*. The quarters should be fairly easy, but not too slack.

Try and have fairly long and straight buttock lines aft, and quite deep bow lines forward, with fair, easy diagonals, and all waterlines as long as possible. If all of these are properly proportioned the hull can be driven fast on all points of sailing.

The topsides should have considerable freeboard and sheer. Don't go to excess here but have enough so that the boat will keep herself fairly free of water and not be putting her deck under quickly if it comes on to blow. Too much freeboard and sheer will make a boat sag to leeward badly.

The lateral plane should be long, with considerable drag, and should be deepest at the after end. This will tend to give windward ability and also make a hull that will steer well on all points of sailing.

For ballast I should use an iron casting outside below the keel, with about 80 per cent of the ballast in this casting. This should extend aft to the rudder and be so shaped that it will always protect the bottom of the boat from damage if one ever gets aground. The rest of the ballast can be carefully stowed inside the hull, where it will best trim the boat and add most to the stability. It must be placed or stowed so that it cannot shift. The percentage of ballast should be from 38 to 48 per cent of the total displacement of the boat, varying with the type of boat. With about 80 per cent of the ballast outside, and a draft of about one quarter the waterline length and a beam of 38 to 42 per cent of the waterline length, one could be assured of a very able small craft and one that would not capsize if knocked on her beam ends, provided a reasonable degree of common sense were used in designing the rig and the remainder of the boat.

A hull with sections, or rather a body plan, based somewhat on the best of the so-called Friendship sloops, with certain modifications, would make an excellent small single-hander. A boat with a hull about as described would make an ideal cruiser for coastwise work or even for an extended sea voyage, if the owner has the necessary physical ability and endurance. She should run and reach well, would be nearly self-steering, and would go to windward well. Many persons belittle windward ability, but do not overlook the fact that prevailing winds at certain times of the year are generally from a given direction, and if one goes cruising with the wind fair, then, sometime, one must return against the wind. I know of nothing so discouraging as trying to make, say from Mt. Desert, to somewhere in Long Island Sound, in the prevailing summer southwester in a boat that will not go to windward reasonably well.

The design I am describing is not intended to be a motor sailer, for there are still persons who want to do their cruising under sail, or if they have a motor it is for use in case of accident, in calms, or while in canals.

The type of boat I am suggesting is suitable for sailing in localities where there is at least six feet of water, which is the case in the majority of places where most of our coastal cruising is done. Of course, if cruising is largely done in shoal waters, an entirely different type of boat should be used, say a shoal centerboarder with considerable ballast outside, a boat drawing not over three feet to three feet six inches, or even a shoaler boat with all the ballast inside.

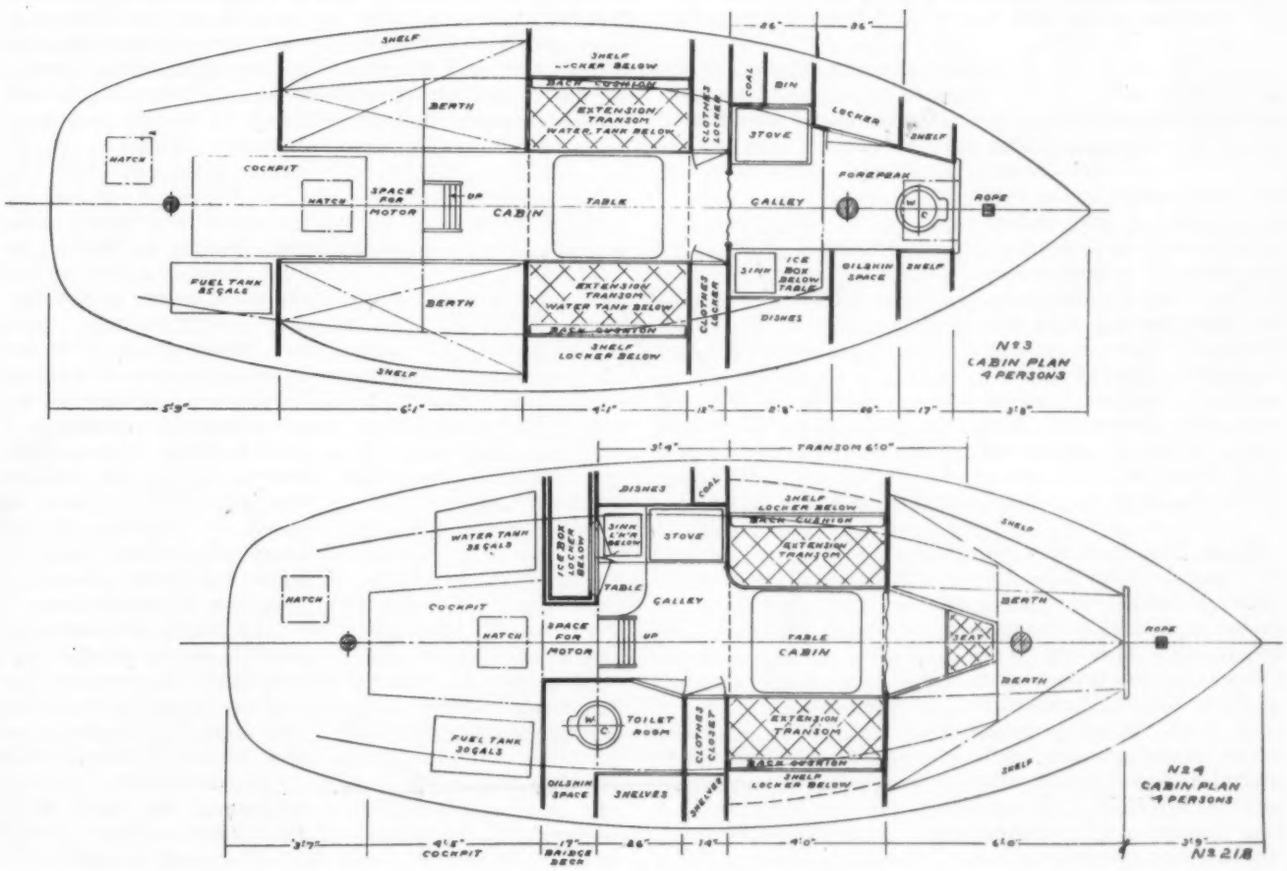
For a single-hander, I have a strong preference for the yawl rig, although the ketch, sloop, or cutter rig could be used if preferred. The advantages and disadvantages of these four rigs are pretty well known, for they have been discussed widely, and each individual is usually "set" in his choice or in his prejudices; but I might briefly state my reasons for the choice of the yawl rig for a small boat that may be chiefly sailed alone. Only the jib-headed yawl rig is under consideration, as I do not consider the gaff yawl as desirable. The same objections to the latter apply as to the gaff ketch: the gaffs sag off and the rig is not good for windward work.

ADVANTAGES: In a yawl rig, the mainmast is from 20 to 23 per cent of the waterline length from the forward end of the waterline. The mizzenmast should be as close to the rudder stock as possible. From 37 to 43 per cent of the total sail area is in the jib and mizzen, hence the sails are of small area per unit so that they are easy to handle. Thus there is perfect balance under whole sail, under jib and mizzen, or jib and mizzen and reefed mainsail, or with a reefed or whole mainsail. At anchor the boat will lie in the wind with mizzen set sheeted in flat, and mainsail set but sheet slacked. The jib-headed rig can be equipped with permanent backstays and mizzen springstay so that spars are always well stayed and there are no backstays to handle. The mainmast is far enough forward so that a long cabin trunk can be used and the mast stepped through the main deck. If properly balanced, the boat will be self-steering, or nearly so. The mainsail can be lowered and reefed while the boat is being sailed under jib and mizzen. If caught with increasing wind the boat can be sailed under jib and mizzen and mainsail slacked off shivering. With sheets on travelers there is nothing to do except steer after the sails are trimmed. The cockpit is entirely clear of obstructions, even the main sheet.

DISADVANTAGES: The yawl rig is more expensive than the sloop or cutter, but not quite as expensive as the ketch. It is not as efficient to windward as the sloop or cutter, but is better than the ketch. There are a large number of spars, blocks and pieces of rigging to take care of. The mizzen outrigger and bobstay sometimes foul the tender when being towed or at anchor. On the whole, this rig is, I think, a combination of efficiency and ease of handling that should recommend itself highly to the single-hander.

The accompanying sketches, which consist of a sail and profile plan, deck plan, midship section, and four varying cabin plans, show about what I have in mind as suitable for a boat for single-handed cruising. This design would produce a craft that is small enough to be handled alone without too much physical effort, and which is still large enough to be reasonably seaworthy and not lively at sea.

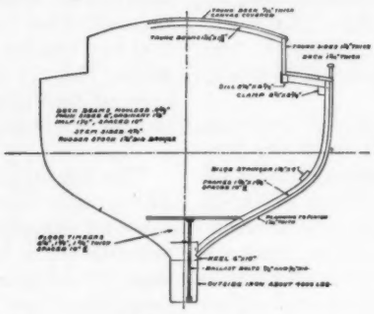
The principal dimensions are: length over all, 26′ 4″, length waterline, 21′ 6″; beam, 9′ 1″; draft, 5′ 0″;



overhang forward, 1′ 3″; overhang aft, 3′ 7″; freeboard, bow, 3′ 11″; freeboard, least, 2′ 2½″; freeboard, stern, 2′ 8″; sail area, jib, 105 square feet; mainsail, 261 square feet; mizzen, 95 square feet; total sail area, 451 square feet. Displacement, about 11,000 lbs.; ballast outside, about 4,000 lbs. of iron; ballast inside, about 1,000 lbs.

A little study of the shape of the midsection and the profile, taken in conjunction with the remarks in the first part of this article, will enable one to visualize the shape of the hull I have suggested. The rig is very obvious and I think needs no further explanation, as I feel sure that it illustrates that my preference is strong for a Marconi yawl.

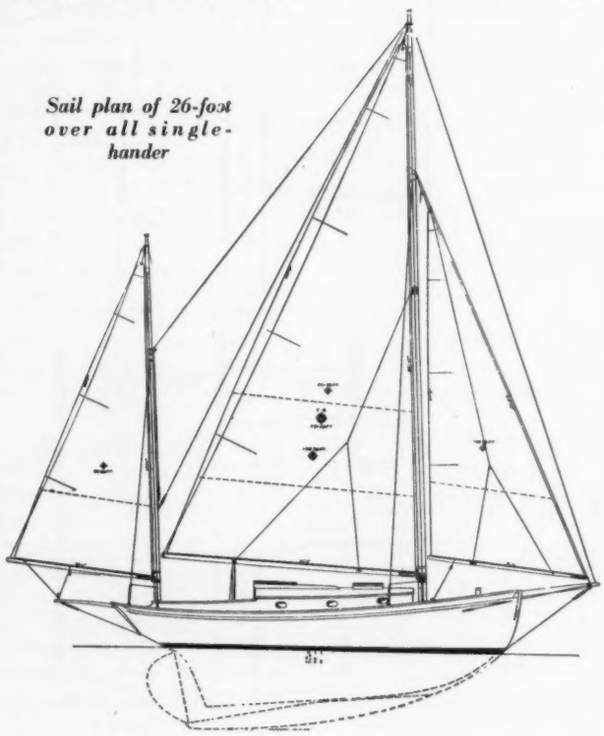
While I have made this design so that the boat may be sailed as a single hander, I have in no way suggested that I think single-handed sailing is particularly desirable, sociable or enjoyable, so I am presenting four different arrangements for suitable cabin plans.



Midship section

Cabin Plan No. 1. This plan is arranged for the comfortable accommodation of two persons, although three may be carried by having an extra mattress to put on the floor of the cabin. Aft, on the port side, is a really workable galley with space for coal or gas stove, sink, dish shelves, refrigerator, dresser and numerous food and utensil lockers. Opposite is a fair-sized toilet room with general storage shelves and oilskin hanging space therein and a good-sized locker for shore clothes. Amidships are two extra long transoms and a dining table. Forward are two lockers for general boatswain's stores, and a large forepeak for anchor cables, etc. This plan is conventional and has proved most practicable.

Cabin Plan No. 2. For three persons. The galley is the same as in No. 1, but in place of the toilet room a high berth has been provided. Two transoms are shown, about the same as in Cabin No. 1. The clothes locker has been moved to the forward end of the cabin. Lockers and shelves are in the forepeak, somewhat as in Plan No. 1. The toilet has been moved into the forepeak. This is not a desirable location, but thanks to the deep forefoot and fair freeboard and sheer, there is plenty of room there and the toilet is out of the way.



Sail plan of 26-foot over all single-hander

Plan No. 3. There are still people who like the galley forward, so I have shown a plan with the galley in this location. The toilet is in the forepeak, as in Plan No. 2. Amidships is a small lounging cabin with transom seats with upholstered backs, and lockers for bedding behind the backs and shelves. These transoms pull out to amidships and the back cushions are put on the extended section so that there is formed a double berth 6′ 6″ by 4′ 0″, about like the lower in a Pullman sleeping car. There are also two clothes closets and a removable dining table. Aft, partly in the cabin and partly under the after deck, are two high berths. These give good quarters for two persons, a livable cabin, and emergency quarters for two more. This arrangement might appeal to those who like the galley forward.

Plan No. 4. Here I have used the same toilet and galley arrangement as in Plan No. 1, with the small living cabin amidships of Plan No. 3, with the Pullman extension seats and upholstered backs, lockers behind and shelves above. Forward, there is a nice double cabin that can really be called a stateroom. What better arrangement could be wished for? The curtain can be pulled and the stateroom closed off from the rest of the boat. There are sleeping accommodations for four. The galley is aft, where many believe it belongs on a small boat, and there is a good toilet room and clothes closet.

Other arrangements can be used and it is probable that many persons have their own pet schemes for utilizing the cabin space.

There is room abaft the cabin steps, below the bridge deck, and under the forward end of the cockpit for a motor. I would suggest a motor somewhere between 5 and 15 horsepower. There are many makes of one-, two- and four-cylinder types that can be chosen that will give this power at 500 to 1000 r.p.m. and that will give the boat a speed of from 4½ to 7 nautical miles an hour in smooth water. Recently, there have been developed at least four 4-cylinder motors of 3¼″ bore and 4″ stroke that are light, short, powerful, have electric generators and starters, that will handle a two-bladed propeller of 17 to 18 inches in diameter, and 9 to 10 inches pitch, at 1000 to 1200 r.p.m. A motor of this type will be of sufficient power to drive the boat ahead in anything but the most severe conditions, and would probably give her some headway in an exposed harbor, if one had to change locations owing to dragging anchors. I would prefer the propeller to be in the centerline, the aperture being as small as possible, rather than off center. One of these 4-cylinder motors is less than 32 inches long.

The deck arrangement should be as simple and convenient as possible. The cockpit shown is about 4½ feet long, and narrow, so that if it is flooded it will not hold sufficient water to endanger the boat. With four large scuppers it will

(*Continued on page 118*)

Gasoline Tanks and Their Installation

By GEORGE F. CROUCH

ABOUT this time every Spring the newspapers carry occasional items headed "The Gasoline Tank Exploded" and the motor boat owner, reading the garbled description of the mishap, is led to believe that gasoline is as dangerous and deadly an explosive as dynamite or nitroglycerine. The actual fact of the matter is that gasoline is not an explosive in any sense of the word but is a fuel just as is coal or heavy oil, and no more dangerous, until its vapor has been mixed with air — and in the proper proportion to form an explosive mixture.

Tanks *filled* with gasoline cannot possibly explode. If subjected to enough heat, raising the pressure inside the tank until it can resist no longer, then the tank will blow up. When that happens the inflammable gasoline will take fire in the air. A water tank may blow up in the same fashion but water will issue as steam. There is the fundamental difference.

Safety in handling gasoline aboard a boat, or anywhere else, comes down to one simple rule. All the elaborate precautions are based on this one thing which, if carried out, makes the fire hazard a negligible quantity. Make the complete installation of the gasoline system in the boat such that it is impossible for the smallest drop of gasoline to get out into the air from the tank, the feed lines, valves, filling pipes or the carburetor, and that is all there is to it.

All of which sounds simple, but the actual carrying out of the detailed work involved in such an installation is the result of years of careful study and much experience. Even the smallest and most insignificant fitting may render the whole thing void as far as safety is concerned. How often does one read that "racing is the experimental laboratory for the motor boat industry"? Whether or not the entire truth of that statement is admitted, the fact is that the test of high-speed racing on the entire gasoline system is a very severe one and any details which are satisfactory for installation in a racing boat of the highest type are more than satisfactory for general service. Practically every one of the details advised and described in this article have had the racing test referred to above.

From the records of fires aboard boats, the most dangerous time is during, and just after, the filling of the tanks. While the filling is going on it is impossible to avoid having some mixture of gasoline vapor and air. But this should not be permitted to collect in the boat or in any confined space. Smoking is, of course, taboo, and even worse is striking a match or using a lighter. The average cigarette or cigar will not ignite gasoline vapor unless it is puffed vigorously, but a live spark dropping down upon high-test gasoline will ignite it. So the "No Smoking" rule should be rigorously enforced. All cooking operations should be suspended during the period of filling and special care should be taken on days when there is no wind to blow away the vapor.

The construction of the tank and the filling pipe has much to do with the safety of the ship. The filling pipe should make a positive and gas tight connection to the deck or cockpit filling plate. Unless this is done gasoline may run down into the hull around the outside of the pipe, and once in the hull the danger is a real one. When the tank is held in chocks or saddles fastened to the bottom of the boat such a tight connection is not easily made because there is always considerable working of the hull between the deck and the bottom. Various forms of slip joints and packings are used but the best and safest construction is to use some form of flexible, metallic gas-tight hose between the deck plate and the tank. Several forms suitable for such use are now on the market and can readily be obtained in suitable diameters. A rigid brass pipe connection between the tank and the deck plate is not advised, particularly for a light boat where one often sees the deck pulled out of shape by the strain on the filling pipe.

From the flexible tube, the filling pipe should lead down to the bottom of the tank. This shuts off the free surface of the gasoline in the tank and exposes only the small surface in the filling pipe. Fine mesh screens can be placed at the top of the pipe if they are desired, but with the pipe carried to the bottom of the tank they are scarcely needed.

If the filling pipe is carried down to the bottom of the tank as advised, then the air in the tank is trapped and nothing would flow into or out of the tank until that air is released. It is necessary to provide a vent to let the air out. This may be done either by fitting a separate boss on the tank to take a vent tube, or better yet carry the vent from a boss on the fitting which takes the filling pipe, and thus reduce the number of tank fittings, each of which should be carefully riveted and then sweated, soldered or welded in place. From the tank the vent pipe should lead to some safe and protected point on the *outside* of the hull and should be bent over in the form of a trap or a gooseneck to prevent water and other foreign matter from getting into the tank through the vent. The tendency when installing the vents is to make them too small. They should be at least half the diameter of the filling pipe to prevent the accumulation of excessive pressures in the tank should unusual conditions arise. This large vent really acts as a sort of safety valve for the tank rather than as an entrance and escape for the air which is replaced by the gasoline.

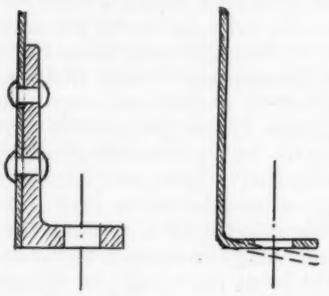
Many and diverse materials are used for the tanks. Copper, monel or Everdur, tinned or galvanized iron, and aluminum or duralumin are found in the tanks of boats of different types. For the racing boat, where weight is of much importance, an aluminum or dural tank will save considerable weight and will usually outlast the racing hull and motor. For the cruiser or runabout, one of the other materials is much to be preferred, not only on account of its durability, but also because it is much cheaper and the saving in cost can be used to better advantage on other items in the construction of the boat.

Copper, monel or Everdur are the best materials as far as lasting qualities are concerned, and the last two, by reason of their strength, make possible the use of thinner sheets than galvanized iron or copper. Iron, either galvanized or tinned, is a very satisfactory tank material provided that the tinning or galvanizing is done after the tank has been formed. When the tank is made of sheets which have been coated before they are formed, and drilled or flanged, some of the protective coating will be damaged and the unprotected metal exposed to the action of any corrosive impurities which may be present in the fuel. But since most gasolines are of a high degree of purity and since the outside of the tank can be protected by paint, even these will give years of service.

The strongest, lightest and most satisfactory tank for

general use is the cylindrical form with the heads either rounded out or concaved into the tank body. Such a form can be built more cheaply and can be of lighter material for a given size than if the tank has large flat surfaces which bulge under the head of gasoline contained in it. Many methods of forming the seams in the sheets of which the tank is made are used. In light work a lock seam which is flooded with solder after the tank is made is a decidedly satisfactory construction. When the metal is heavier the joint may be riveted and then made absolutely tight by welding or by soldering. Some tank manufacturers with special equipment and trained operators are able to furnish welded tanks in even the lightest gauges, making them practically a one-piece job.

If cylindrical tanks are used, then the fittings for the filling pipe and for the feed line and any other attachments should have ample flanges which are inside the tank. These are put into place before the last head is put into the tank and are held in place by three or four rivets. Then solder is run entirely around the flange and works its way between the flange and the plating of the tank. The reason for placing the flange on the inside of the tank is to facilitate the flooding of the flange with the molten solder which is more easily done when the flange is on the inside of the tank than when on the downward curving outside.



Tank straps should have substantial lugs riveted on to take clamping bolt. If merely flanged over the flange will spring, as shown by dotted line, and tank will go adrift

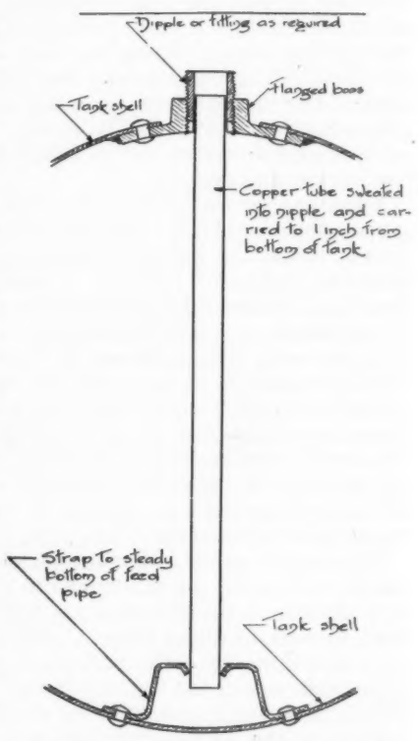
No matter how the tank is made, it should be tested before being placed in the boat. All outlets except one should be plugged tightly and then air pressure of five to ten pounds per square inch should be applied through the one outlet which has been left open for that purpose. If the tank can be immersed in a tank of water, any leak will be shown by the formation of bubbles. But much care is needed to inspect each inch of every seam and every rivet head and flange. Gasoline will seep through a hole in the metal which will show only the smallest air bubble. If there is no vat or tank in which the testing can be done, good results can be secured by testing the tank when pumped up to the testing air pressure with a solution of soap and water. This solution is sponged over the surface to be tested and if there is a leak it will be shown by the formation of a bubble. It requires a sharp eye to detect the little ones.

Sometimes it is necessary to repair a tank which is in service or which has been emptied recently. If possible, the tank should be thoroughly cleared of all gasoline vapor by blowing steam into it. The empty tank from which the gasoline has been drained is the dangerous tank; the tank which is filled with gasoline is not dangerous. During the war hundreds of submarine chasers were built for the government by yards which had no previous experience with work of that character. The gasoline tanks in these boats were huge rectangular affairs and the government specifications demanded that they be tested by filling with gasoline and then putting a hydraulic head on them by threading a stand pipe into one of the fittings on the tank top. Even though the tanks were given a careful air test before the hydraulic test with gasoline, it was rare to find one which did not show seepage of gas at some point. As each tank held over 600 gallons when filled, it was a long and tedious process to pump it out, steam the tank, make the repairs and then go through the testing process again with perhaps the chance of having it to do all over a second time. As long as the tank was completely filled there was no danger of explosion but only that of fire on the outside of the tank, a fire which could be readily extinguished with heavy pieces of carpet. Repairs were made with a hot soldering iron without any trouble at all when the tank was full. But the men who did the work would not believe that the gas in the tank was not explosive. When they had a chance, they tried to repair a tank after they had emptied the gasoline out of it without thoroughly cleaning it by steam. The result was just what might have been expected. In one instance the tank exploded, killing three men who were working on it. The process of emptying the tank and the partial cleaning with steam had introduced just enough air to mix in an explosive proportion with the gasoline vapor and the hot soldering iron did the rest. Not that soldering a tank full of gasoline is to be recommended, but if you must solder a tank without clearing out all trace of vapor it is safer to do it with the tank full than it is when it has been completely or partially emptied.

Another illustration to show the danger of the empty tank, and another caution. Not so long ago there was a serious tank explosion on a modern boat in which great care had been taken with the tank and fuel installation. The tanks were carefully vented overboard through seamless copper tubes. Piping, tanks and fittings were of the highest grade and most carefully placed. During the winter the boat was laid up and the gas tanks were supposed to have been drained. In the spring she was given a new coat of paint and, as a preliminary to painting, the old paint was burned off with a blow torch. All went well until the painter applied the blazing torch to the thin-walled, copper tube which served as the vent, heating it until it ignited the mixture of air and gasoline vapor which had formed in the tank and tube during the winter. That mixture happened to be just right to give a terrific explosion which practically blew the boat apart.

Now for the caution. Do not lead the vent from the tank where it lies against a painted part of the hull, for at some time some one is sure to put a torch on it with disastrous results.

All tanks should

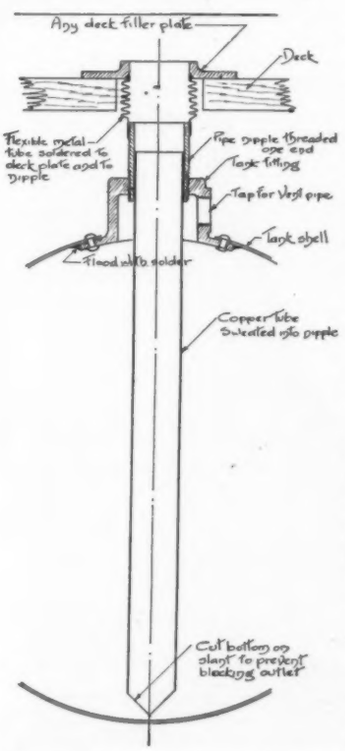

Nipple or fitting as required
Flanged boss
Tank shell
Copper tube sweated into nipple and carried to 1 inch from bottom of tank
Strap to steady bottom of feed pipe
Tank shell

Showing feed line taken from top of tank

have diaphragms or swash plates to keep the liquid from rushing from end to end and, in rectangular tanks, to help hold the flat surfaces. In such tanks the rivets or welds which attach the swash plates to the outside of the tank are subjected to heavy strains and often are points where leaks develop if the work is carelessly done. Cylindrical tanks need fewer swash plates than shaped or flat tanks because the circular section does not tend to deform when carrying the weight of the fuel. But they should be used to check any shock which might be caused if the tank is partially filled and the boat pitching or rolling sharply.

Why it should be true no one can explain, but one of the most difficult things to get in a new boat is a gasoline tank which is thoroughly clean. How some of the things which I have seen taken out of the tanks of a boat just put into commission get into the tank cannot be explained other than by the rather unhappy conclusion that they were put in there purposely. Even when a clean tank is put into a hull before the woodwork is completely finished, every opening must be kept tightly plugged to keep out sawdust, shavings and chips. Too much stress cannot be given to the importance of having a clean tank. The smallest chip or piece of sawdust is large enough to endanger the safety of the boat, provided it gets into the carburetor nozzle, and if dirt is present in sufficient quantity it may cause clogging of the best strainer made and do it at the most inopportune time. If possible, each tank should have a drain at the lowest point so that any dirt can be washed out through it. The drain plug should be threaded into a flanged boss of the same general type as that used for all the tank outlets.

Regarding the proper method of attaching the fuel line at the tank, there is some divergence of opinion. Some prefer a substantial boss riveted and sweated to the bottom of the tank with the fuel pipe, or fitting, threaded up through it and extending into the tank about an inch above the bottom. This leaves the very bottom of the tank to act as a sediment receptacle but reduces the usable capacity of the tank by a corresponding amount.

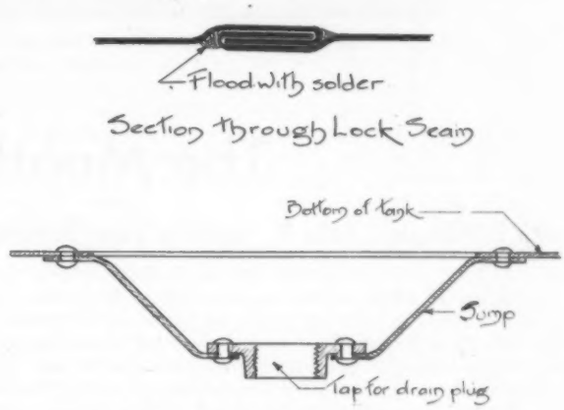

Any deck filler plate
Deck
Flexible metal tube soldered to deck plate and to nipple
Pipe nipple threaded one end
Tank fitting
Tap for Vent pipe
Tank shell
Flood with solder
Copper tube sweated into nipple
Cut bottom on slant to prevent blocking outlet

Section of cylindrical tank showing deck plate, filling pipe, and attachment for vent pipe

Now that some form of fuel pump has become standard practice on almost every marine motor, many builders advocate that the fuel supply line be taken out of the top of the tank with the tube extending down into the tank to within about an inch of the bottom. There is a certain factor of safety with such an arrangement which is absent in that first-mentioned method of attaching the feed line to the tank. In case the feed pipe is broken fuel cannot run out of the tank except by siphon action, while the first connection will empty the tank.

Should the feed line be carried down inside the tank be sure that some form of anchorage is provided inside the tank for the lower end of the pipe. The writer had the unfortunate experience of a complete breakdown due to the breakage of that portion of the pipe inside the tank from the fitting at the top. This break was caused by the vibration of a powerful, high-speed motor. Without that little portion of tube leading down into the gas, the motor is no better than an anchor as far as getting anywhere is concerned.

Many years ago — more than I care to think about — I spent most of the time during a motor boat race to Bermuda carrying gasoline in a ten-gallon can from a pair of large temporary tanks, installed aft in the cockpit, up over the house top and then straining it through chamois into a tank in the very nose of the boat. Not a very pleasant or instructive manner in which to spend the days and nights of an ocean race. But it did teach one thing. Have the tanks clean, and then, for ocean racing or cruising, install feed lines, strainers, and the whole system from the tank to the carburetor, in duplicate. The single pipe line leading from one of the temporary tanks to the carburetors was so tightly plugged with dirt that it could not be cleared, and only by siphoning the fuel out of the top of the tank and then straining it into the one clean tank on the ship could it be fed to the motor. With a complete duplicate system and a good air pump such as is used for inflating auto tires one line can be cleared while running on the other.



Drain plug located at bottom of sump

Except for the fact that it adds another attachment to the tank, a sump or well into which the drain plug leads is a good thing. It is particularly advised for tanks which have large, flat bottom surfaces, for it provides a sort of catch-all for all foreign matter and for water which will be found in a gasoline tank no matter how carefully the gas is strained when put into the tank. Since the gas is replaced by air which enters the tank through the vent, that air carries the same moisture content as the outside air. Then when the tank cools, due either to a change in the outside temperature or to cooling of the interior of the boat, part of that moisture will be condensed and will sink to the bottom of the tank. If the feed line is kept up from the bottom of the tank there is little trouble experienced with the small amount of water which collects, and in a cylindrical tank only a small amount of gas need be drawn off in order to get most of the water out. But if the tank is flat on the bottom and no well is provided in which the

(*Continued on page 102*)

Boats of the 22-Square-Metre Class racing on Lake St. Clair, off Grosse Point, where these little craft have proved popular

The Month in Yachting

Lake Michigan Looks Forward to Busy Season

LAKE MICHIGAN yachtsmen got their first taste of competition after a long winter of inactivity on Memorial Day, May 30th. From the Milwaukee Yacht Club, on the north, to the Jackson Park Yacht Club, on the south, all six sailing clubs swung into action with the first races of the season and Lake Michigan took on new life after the somber gray of a cheerless winter devoted to cradling an occasional tramp steamer on her broad bosom.

With the coming of the new season it may be in order to go poking around these different yacht clubs and find out just what is new and what plans are afoot.

The Chicago Yacht Club, with a new Commodore, Clark C. Wright (and an even newer coat of paint), are very much elated over the acquisition to their already large fleet of the Class Q yacht *Hope*. Easterners will recognize this craft as the one that John Alden designed for his own use. Caleb Loring took her in hand the middle of the season and she stepped along nicely under his guidance. Sanger P. Robinson, who has done most of his sailing on Buzzards Bay, purchased the *Hope* and she will fly the Chicago Yacht Club burgee. There are many who say that this will sound the knell for the Karas Brothers and their *Siren*, which has had such phenomenal success in the Mackinac Race. The Karas boys say "No," and are anxious to prove it when the fleet lines up for the annual race to Mackinac on July 16th.

Sterling Morton's schooner *Freedom* will remain with the Chicago fleet this year, after having sailed all last season in the East and completed a voyage to the West Indies. This will be the largest schooner on Lake Michigan and a welcome addition to the C. Y. C. fleet.

The Eagle Class fleet, consisting of *Orn*, *Aquila*, *Falcon*, *Altair* and *Hyack* are a colorful lot this season. A master mind has been at work with a novel color scheme and the entire fleet is resplendent with color schemes that range from green to black, with a dash of ochre thrown in for ballast. *Falcon* has a battleship gray deck and sides, aluminum bottom and black boot top. The Eagle Class can always be counted on for something novel.

The R Class is about as it was last year with most of the old reliables under canvas. One important change that is rather bewildering when one hunts for a reason is the switch between the *Alert IV* and *Gossoon*. *Gossoon*, which at one time belonged to Charles Francis Adams, was purchased by a syndicate of Chicago yachtsmen after the Richardson Trophy races in 1930. She was not raced much last year and *Alert IV* took the honors in the class. This year *Gossoon* is once more returning to the wars while *Alert IV* will remain in her cradle at the yard. It appears as if the argument (if any) as to which is the best boat will never be settled as long as these two keep gracefully avoiding each other. The other classes at the Chicago Yacht Club are prepared for a big season.

The Milwaukee Yacht Club, under Commodore N. L. Telander, home of *Dorello* and *Vagabond*, who yearly supply the acid test to the Chicago boats in the Mackinac Race, is groom-

"Mouette" under sail for the first time in American waters. This "Twelve" was recently purchased by Horace Havemeyer and will race here this summer

ing its spacious clubhouse in preparation for the entire Chicago fleet to which it will play host on July 4th when the annual Lake Michigan Yachting Association Regatta will be sailed there. The Chicago boats will race up over night, a distance of 90-odd miles, will compete in the regatta the following day, and then race home.

The Sheridan Shore Yacht Club, at Wilmette, under the guidance of Max Hayford, the new commodore, have extensive plans for a busy season. This up-and-coming club sails Star Class yachts and has a fleet of eighteen. Regattas are held each Saturday, regardless of weather, throughout the season.

The Columbia Yacht Club, which is the down-town club of Chicago yachtsmen, is busy preparing for its annual cruising race to Michigan City, which this year is scheduled for June 18th and is always the first long distance race of the season. A fleet of over 75 boats usually face the starter's gun in this event, and this year should find as large a number as ever at the starting line.

The Jackson Park Yacht Club also has a new commodore this season in the person of Charles W. Kraft, who is a member of the World's Fair committee on yachting and who has done much to promote activity at this popular South Side club. Jackson Park yearly sponsors two long distance races, one to Saugatuck and the other to Michigan City. Their racing, while it comprises all classes, has the strongest competition in Class Q, of which it has a sizable fleet.

STEVE HEALEY

"Lehg," an ex-8-metre yacht recently sailed single-handed from France to Buenos Aires, by Vito Dumas

The Lake Ontario Season

FRESH water sailors of Lake Ontario, from the owner of the most palatial cruiser to the skipper of the smallest dinghy, have an interesting and busy season to look forward to.

The Canada's Cup series at Rochester the first week in August, in which the Rochester Yacht Club will defend the historic trophy against a Canadian eight-metre invasion, will occupy the center of the stage. It is understood that *Thisbe* will be back at Rochester. Her previous fresh water record as well as that made while under charter on the East Coast last season, ending in her tie with *Priscilla* in the King of Spain Trophy races, would indicate that a better defender would be hard to find.

The Royal Canadian Yacht Club has not yet named a challenger, but to their trio of 1930 eights has been added the new Fife-designed *Invader II*, which came out from England last fall. Mr. Fife has had a great deal of experience designing for Lake Ontario conditions, and was remarkably successful with his "Eight" *Saskia* which defeated *Priscilla* decisively on the Clyde when she tried to bring home the Seawanhaka Cup. Consequently, big things are hoped for from his latest creation.

The sixth of August should see the Canada's Cup series completed, and on that date the Freeman Cup Race, Ontario's annual distance event, starts from Rochester. The course leads east around the Main Duck Islands, then west to Cobourg, a total of 130 nautical miles. Here the three-day regatta of the Lake Yacht Racing Association will be held on the 9th, 10th, and 11th, with racing for the Gooderham Trophy in eight-metres, and the Lipton Trophy in "R's," as well as daily events for all other classes.

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Program for the Larger Yachts

WHILE the fleet of major racing yachts on the Atlantic Coast this year may be but a shadow of the great armada of two years ago, it will still furnish some interesting racing. *Vanitie* and *Weetamoe*, of the "I" and "J" classes, and *Clytie*, *Cantitoe*, *Mouette* and *Iris* in the twelve-metres, will have a chance of sailing in at least a score or more races before the season closes, and some of the other large ones may be out for the New York Yacht Club Cruise in August.

The two big cutters, upon each of which have been expended fifteen to twenty thousand dollars in the way of new masts, new sails and new rigging, will go into commission early this month and start racing at Newport almost immediately.

These two yachts, perhaps accompanied by the "Twelves," will start east after the Harvard-Yale regatta at New London and, pausing for two more races at Newport the last week of this month, will reach Marblehead early in July. The Eastern Yacht Club will then invite all hands on a cruise, the itinerary being as follows: July 4th, annual regatta at Marblehead, Puritan Cup; July 5th, run to Gloucester; July 6th, run to Kittery; July 7th, run to Rockport; July 8th, run to Provincetown; July 9th, run to Marblehead.

It is expected that the twelve-metres will return from Provincetown to prepare for Larchmont Week, but *Vanitie* and *Weetamoe* will continue racing off Marblehead for two weeks more. The two larger yachts, with the four "Twelves," will meet again at Newport on August 1st, 2nd and 3rd for the Arthur Curtiss James and William H. Vanderbilt Cups.

WILLIAM U. SWAN

"Barlovento," a new schooner designed by Cox & Stevens for Pierre S. Dupont, 3rd, which will be a starter in the Bermuda Race

"Felix II," driven by Charles Cabot won the Albany to New York race in record time

"Pauli's Cyclone," driven by George Pauli, winner in Class D Open, at the finish

New Haven Day on the Hudson

A COUPLE of young men from New Haven, Conn., of no particular pretensions as outboard aces, turned the fifth annual Albany-to-New York motorboat marathon on May 15th into a private contest that ended with Charles Cabot, in a boat he built himself, leading Kenneth MacKenzie, a 17-year-old high school senior, across the finish line by a couple of boat lengths.

They were timed a second apart in just under three hours for the 132¼-mile passage from the Albany Yacht Club to the Colonial Yacht Club at 152nd Street, a performance that shattered all records for long distance outboard racing. Cabot's time was 2 hours, 56 minutes and 39 seconds, an average of 44.4 miles an hour. The previous record, 3 hours and 10 minutes, 41.8 miles an hour, was established in the 1931 race by Wade Woodworth, of Evanston, Ill.

After Cabot and MacKenzie had climbed onto the float and posed for the presentation of the Haynes-Griffin Trophy to the winner, Edgar Greason, Jr., of New York City, sputtered home in third place to win the Commodore Gerald C. Holbrook Trophy for the first amateur to finish. Cabot and MacKenzie are both professionals. All were driving in Class F. Greason also had the distinction of being inside of the old record.

The inboard runabout record was also bettered. Jack Prosser, who drove *Miss Dee Wite* to victory two years ago when the runabouts were added to the Albany grind for the first time, had the wheel of Paul Prigg's Miami-built, lap-streak sea skiff, and brought her home half a minute ahead of Al Buffington in *Betty K.*, a three-year-old Dodge 16-footer. Prosser's time, 4:01:10, lopped 13 minutes off the mark made last year by *Miss Aldine*. The Prigg boat, a big, heavy craft powered with a converted Ford engine, averaged 32.9 m.p.h. *Miss Aldine*, with Wigglesworth at the helm, was third, just one minute slower than her winning time of 1931.

Three of the 125-cubic inch piston displacement hydroplanes turned out for the race and two of them finished an hour and a half apart. The winner was *Flying Eagle*, driven by Edison Hedges, of Atlantic City. His time was 20 minutes slower than that made by J. Walter Peterssen last year.

Other records besides those relating strictly to speed were broken in this Albany race. Only 31 boats out of the 85 actual starters finished inside the time limit, the highest percentage of casualties since the event was inaugurated. Twenty-two of the finishers were outboards, the survivors of a fleet that numbered seventy-odd at Albany.

Just why so few of the little fellows got through is not clear. Certainly, conditions could not have been better for the race. The day was bright, clear and warm, and not until noon, four hours after the outboard start, was there so much as a ripple on the river. The breeze freshened in the afternoon and the runabouts, which started an hour after the outboards, and the slower stern winders took a beating in Haverstraw Bay where the heavy ebb tide met the upstream wind.

The spring freshets left the upper reaches of the river below Albany in poor shape and drivers who tried to cut corners off the channel undoubtedly discovered new shoals and collections of submerged tree branches.

The most pleasing feature of all was the unprecedented number of newcomers in the field, two of whom, Al and Dick Harvey, of Milwaukee, Wis., finished well up front and in the prizes. There were many other unfamiliar names alongside those of the veterans in the trophy lists.

Rosenfeld Photos

Kenneth MacKenzie in "Humarock Baby" finished only one second behind Cabot in Class F

The winner of the 125 Cubic Inch Class, "Flying Eagle," driven by Edison Hedges

Under the Lee of the Longboat

by Cap Stan

FROM the account of the stranding and loss of the Norwegian cutter *Teddy* it appears certain that an auxiliary motor would have saved her quite easily. Offhand, I'd say that both *Shanghai* and *Direction* could have been saved by the use of auxiliary power, and Carl Weagant tells me that on at least two occasions in the Mediterranean Sea *Carlsark* was saved by her motor. Which is just one more argument against those of the die-hards who steadfastly persist in refusing to make their cruising simpler, easier, safer and more enjoyable in every way.

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Would you rather loan your boat to a perfect tyro, or to some one who has sailed for many years without getting into trouble of any kind? The answer is obvious. Yet the insurance companies make no distinction — the tyro gets the same rate as the experienced sailor. Surely more tyros make claims on the insurance companies than do experts. Which means that the experts, by paying the same high rates, are paying the bills of the tyros. Quite a few yachtsmen are getting fed up on this situation, and are going without insurance — it costs too much. If there is anything at all in "moral risk," certainly the expert should be favored over the tyro. Why don't the insurance people get busy with this idea?

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I have read with great interest the comments of J. S. Barnes and "Dinghy Dan" on the different types of dinks. In general, they're both right, though I fear that Mr. Barnes is a bit damp if he believes there is more "life and feel" in his so-called International 14-footer than there is in a Frostbite Utility dink. More speed, yes, but no more life and feel. If Mr. Barnes doubts this, let him come down and borrow my dink, and I think he'll change his opinion. Furthermore, judging by an article by G. I. Pout in the March 11th issue of *Yachting World*, the Lake Ontario 14-footer isn't the 14-foot International dinghy at all — for several reasons. In commenting on Mr. Barnes's original article in YACHTING, Mr. Pout remarks, in part: "One of our modern 14-footers would beat the American fifteen to twenty minutes around the Prince of Wales Cup course in a breeze of wind! . . . Surely, then, if the American writer has lost his heart to the 14-footers as he knows them, he would give his soul for the one such as we know, ten years ahead of the American design." The American 14-footer is undoubtedly a fine little boat, but our British cousins refuse to call it an International 14-footer, and insist it's antedeluvian both in hull design and rig.

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A participant in the recent six-metre races in Bermuda seems to think I was a bit hard on the American boats in my criticism last month, stating that the Bermudians were sailing in their own waters, with thoroughly tried boats in the hands of experienced crews, whereas the Yankee craft were just being shaken down into some kind of racing shape, and that their crews were not expert in every boat. All of which is true. On the other hand, I have it on excellent authority that the skipper of one of the American boats became disgusted at a new parachute spinnaker and discarded it, finally loaning it to one of the Bermudians, who promptly went out and won a race with it. We were two or three years behind the Scandinavians and Germans in adopting the Genoa jib. We have something on the rest when it comes to knowledge about double and parachute spinnakers. Are we going to slap opportunity in the face?

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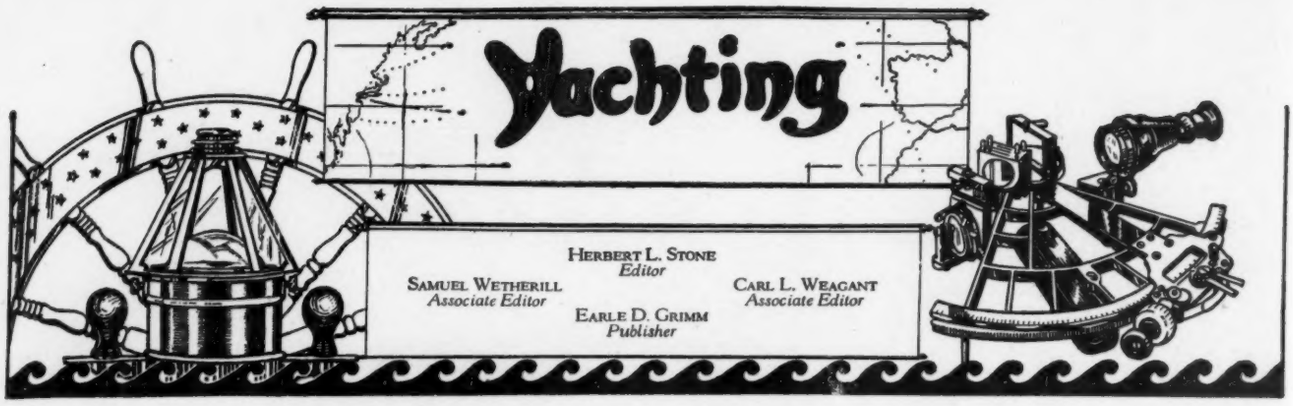
Restrictions on sails will be in force in the Bermuda Race and the Stamford-Vineyard affair, and the British are talking about adopting something of a similar nature. The idea seems to have struck a popular note all around. Of course, there will be some howling, but on the whole it is probably a move in the right direction. The Riverside crowd have increased the time allowance by half in their Stratford Shoal overnight race, to give the smaller boats a better chance, while I understand that the Bayside committee is considering reducing the handicaps, records in the Bayside Block Island Auxiliary Race having shown that the large boats never win. Of course, conditions differ in a race where power is used from one which is purely a sailing affair, which is probably why the two committees are proceeding in different directions. It will be interesting to see how these changes work out.



EDITORIAL

Whitewashed!

IT APPEARS that after all the smoke and fumes engendered during the running of the Col. Green Trophy race at Miami, there was no fire. At least the officials of the American Power Boat Ass'n could find none, and the outboard drivers in that event have been restored to good standing and given a clean bill of health. The cup remains here and international amity has been restored — perhaps.

Evidence of concerted action to "team up" against the foreign drivers was lacking. Even if this exists, it is very hard to prove. The American Power Boat Association heard all the evidence there was, and acted with commendable promptness, but could find nothing tangible on which to uphold its earlier suspension. What power boat racing needs is a different spirit in competition that will not make it necessary for us to *prove* afterwards that we are playing the game on the level. Until this spirit is apparent, foreign drivers had better trust their stop watches and the starting guns rather than their competitors.

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Sales Tax on Boats Probably Dead

IN CONSIDERING a tax bill to balance the budget, the lower house of Congress proposed an unfair and discriminatory sales tax of ten per cent on yachts and motor boats. This provision called forth strenuous protest and, if passed, the provision would have imposed a hardship that boat builders and manufacturers could hardly have survived. Our latest information on the subject is that the Senate Finance Committee has recommended the entire elimination of this tax. We hope that no effort will again be made to insert it in the tax bill which, finally, is passed. Such a tax would have produced almost no revenue and would have had a detrimental and lasting effect on the building, and hence the use, of pleasure boats. It would, if passed, have had the same effect as reducing the present import tariff on foreign built boats by 10 per cent. As it is, this tariff, which is now 30 per cent, does not equal the differential in cost of building between most foreign countries and the United States.

We hope the tax has been killed permanently. Yacht builders and users are willing to bear their fair share of the burden of taxation at this time, but not such an unequal division as this particular tax would have imposed.

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The Bermuda Race

THE hold that ocean racing in general and the Bermuda Race in particular has upon yachtsmen is evidenced by the list of entries for the race to the Land of the Lily and the Onion, scheduled for this month. In a year when it seemed problematical how many yachts would be out, it is gratifying to learn that probably twenty-five starters will be at the line on June 25th for the long ocean thrash. The calibre of the fleet this year is particularly high. There will be in the squadron at least two, and possibly three, new schooners, launched this spring, while two British entries are on their way here for the race, and two Bermuda boats will participate. Certainly this does not bear out the cry that "hard times" will kill yachting.

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The Coming Season

WITH the opening of the active yachting season close at hand, the prospect is far brighter than the drab predictions of a couple of months ago led one to believe. Scheduled yachting events do not seem to have been curtailed in any way, and while the size of the fleets in commission may not be as large in some cases as they have been in the past, but few of the racing classes will suffer by lack of competition, and in some cases the size of certain classes will be larger than in 1931.

Some of the larger yachts will not be out, or will be out for a limited season only. This, perhaps, was to have been expected. But even here we believe the chances are good that many of those boats whose owners decided two months ago to stay out of commission will be seen underway before the summer has passed. Fine sailing weather, a few warm days, and good racing in the yachting centers will convince many owners that they still can afford to get afloat, and that a short season is better than none at all.

IN THE WORLD OF YACHTING

GARNER H. TULLIS

WE INTRODUCE this month a southern sailor who has been one of the staunch supporters of ocean racing on the Gulf of Mexico, Garner H. Tullis, Rear Commodore of the Southern Yacht Club, of New Orleans. Garner's sailing activities have not, however, been confined to ocean racing. For the past ten years he has been racing actively on Lake Pontchartrain, in various boats and classes. In 1923 and '24 he owned and sailed the "Circe" in the old 21-foot class. In 1925 he bought the famous Herreshoff 21-footer "Sorceress," renamed "Mallegar," and sailed her in that hot class for two years or more. During this period he was rear commodore of the Southern, the second oldest yacht club in the United States, only the New York Yacht Club being senior to it in point of years.

In 1929 Tullis bought the schooner "Windjammer" from Commodore Edward Crabbe, of the Cruising Club, and when the St. Petersburg-Habana Race was inaugurated the following spring he entered her in this event and won in the larger class, taking the General Machado Trophy. In 1931 he was again at the line, and took second place in his class and in the fleet as a whole. This year he "came back" and again won the long race, "Windjammer" being also the first boat to finish.

Mr. Tullis is affiliated with the Southern Yacht Club, of which he is a flag officer, and with the Biloxi Yacht Club.

The Ventilation of Power Cruisers

Some Practical Hints and Gadgets Which Add to Comfort Aboard

By GERALD TAYLOR WHITE

ONE of the greatest claims for boating as a healthful pursuit lies in the amount of pure air supposedly breathed by yachtsmen. This may be quite true during the day, or even at night in the larger boats, but the small power cruiser sleeping four persons in a cabin ten feet long and not that wide often has an atmosphere closely resembling that of the Black Hole of Calcutta.

There is no need for this lack of ventilation. Primarily, the cabin of a boat must be arranged so as to be absolutely watertight at all times but that does not mean that it must be airtight as well. Three or four little port holes open are not enough even if the cabin slide is left open. There may be enough cross-sectional area to pass sufficient air, but there is no induced draft.

Contrary to general opinion the air circulation in the cabin is usually from aft, forward. There are exceptions to this rule, but they are in the minority. If the cabin door is left open a lot of air would come in, provided it found a place to go out again. You cannot get air into a bottle by blowing down the neck. In some cases we find hatches forward arranged with the hinge at the after edge. According to the ideas of the owner, these hatches scoop air down into the cabin and it passes out through the open door, assuring ventilation.

Sometimes it does, but more usually the action is the reverse. Behind the cabin structure there is an area of low pressure, a partial vacuum caused by the air sweeping along the side of the house. The air eddies abaft the cabin bulkhead just as the water eddies behind the transom stern. The slight negative pressure draws air inward and some of it will pass through the cabin if there is means of getting it out again. In most cases the hatch scoops some air which goes below only to meet the air flowing in from aft. The two currents balance the pressure and nothing happens.

All of these things can be proved in the average cabin by watching the smoke of a cigarette. Experiment with various methods of opening hatches and ports and you will be surprised to see the smoke react to the changing currents.

There are two sorts of ventilation possible in a power cruiser. One is natural draft which is obtained by clever designing plus common sense in the opening of proper outlets. The other is forced draft and requires one or more electric blowers discharging foul air and allowing fresh to come in through any convenient openings.

In recent years a number of small electric blowers have come on the marine market, some requiring very little current to operate. However, if the only electric current on board comes from the usual single-battery, starting-lighting system it is somewhat doubtful whether the battery capacity is sufficient or the generator output capable of replenishing the current as fast as it is used for the various necessary services. I'll be frank in saying that this opinion is not the result of practical experiences with the small blowers.

There is one time when the blower system will not work and that is when the boat is left at anchor with no one aboard for days at a time. It is hardly possible to believe that the blower could operate night and day for a long period without discharging the battery. It is during this closed-up period that most of the rot, most of the warping and most of the rusting of metal parts takes place. With a separate, automatic electric generating plant the story is, of course, different.

At anchor the boat is an enlarged self-basting roaster. The hot sun beats upon the topsides

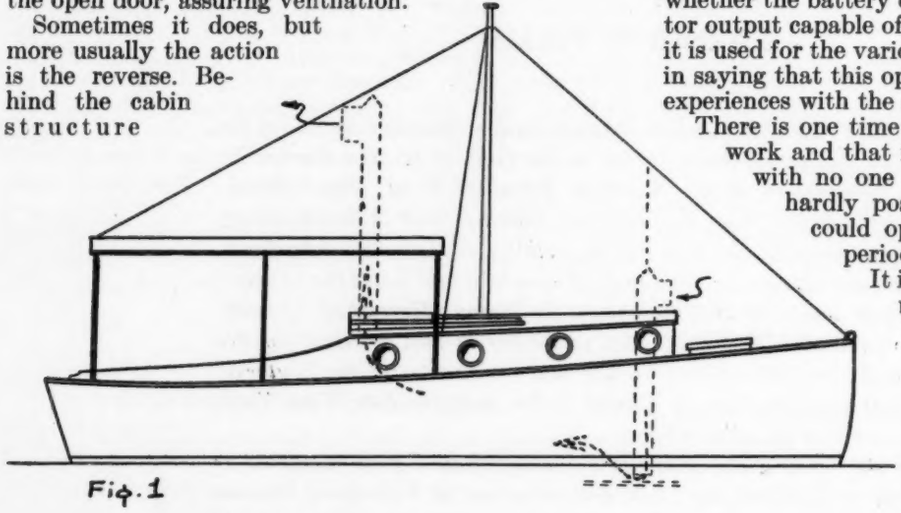

Fig. 1. Showing location and approximate size of intake and outlet windsails for a small cruiser. The air current is indicated by arrows

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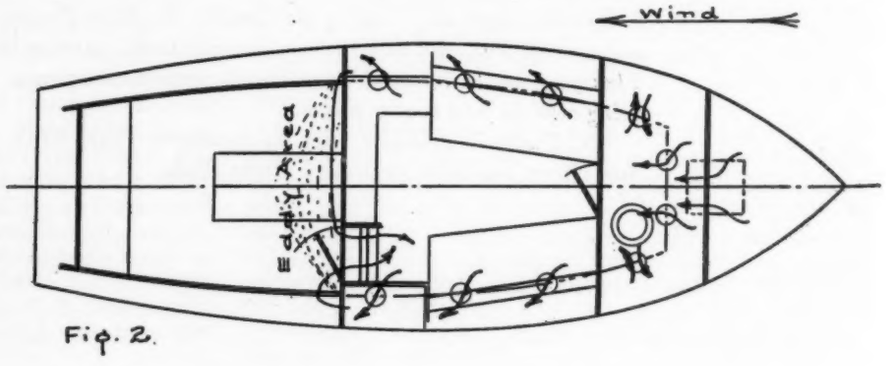


Fig. 2. Air circulation in average small cruiser at anchor heading up to the wind. Note that air flows in cabin door due to slight vacuum caused by eddies. The side ports way forward probably have a negligible effect

and deck, evaporating the bilge water, which rises as vapor and is later, in the cool of the night, condensed as drops of water all over the inside of the hull. This cannot be a good thing for the wood or the equipment.

We are thus faced with two problems; one, that of getting sufficient air to flow through the boat when the craft is in use, and the other to get enough circulation when she is lying at anchor, unattended. If she is placed in a slip the difficulties are more pronounced for she cannot head up into whatever wind there is.

At anchor or lying to a mooring, the average boat will head up into the wind. If there is a cockpit aft with side curtains down the enclosure will act as a sail and tend to keep the bow up. If the shape of the superstructure is such that the boat does not drift off at the stern a small sail may be rigged to keep her heading up to windward. In spite of all of these helps some boats will not lie properly under certain conditions of tide and current. There seems to be no help for such "critters."

Once we have arranged the boat so that she will head up into the wind the next step is to provide openings to induce a draft. In the occupied boat windows, ports, hatches and companion slides can all be opened. The stunt, then, is to remember that all the openings must not be to windward if a draft is expected. There must be a greater area for the outgoing air than for the incoming. The reason for this is that the air in the cabin will expand from the heat and demand a larger opening at the outlet.

Large ships use windsails for induced draft. These are tubes of canvas rigged from the masts with winged openings faced in the desired direction by means of vangs. It is remarkable that small boats are not similarly equipped. There should be at least two such devices. One, rigged low down and facing forward, will permit a draft of air to enter the cabin provided a higher one, facing to leeward, is rigged for the outgoing air. Remember that the higher the chimney the greater the draft. Good height for the suction windsail is far more valuable than the location of the intake windsail.

If the intake tube hangs right down through the cabin to a point just above the floor, or even through a hole in the floor but well above bilge water, the incoming air will sweep gasoline and other fumes out of the bilge where they hang, being heavier than air. If there is enough draft the fumes will be carried out through the suction windsail which should terminate within the cabin just below the high part of the house roof.

As it takes only a few minutes to rig these windsails there is no reason why they cannot be put in place every night when the boat is anchored. The fact that the intake tube runs down through the cabin is a small matter as it can be pushed aside by anyone passing. The suction tube is too high to be in the way.

There should be no argument that the windsails are unsightly. No item of boat gear is unsightly if it is rigged in a seamanlike manner and at the proper time. As the scoops can be unshipped and rolled up there is no storage problem.

But how about windsails when the boat is left unattended? An opening that will pass air will also allow rain to enter. True enough, but what of it? The amount of rain that can come in through a windsail can never cause any serious damage. Perhaps during a bad storm, there will be a bucketful of water taken in through the intake scoop. If the tube runs down to the floor and is arranged to hook there a few drain holes will send the water down into the bilge.

Another trick is to have a section of the lower end of the tube, say a foot and a half long, removable by means of lacings or snaps. When leaving the boat for any length of time, put the deck bucket under the shortened tube and run a couple of pieces of light line between bucket and tube to keep the latter centered. If it rains heavily while you are ashore the worst that can happen is that you will have to empty a bucket of water overside upon your return.

At one time there was upon the market a metal air scoop with scuppered baffle plates which collected rain water and returned it outboard. I haven't seen one for years but I see no reason why this device should not sell.

So far we have said nothing about the ordinary metal cowl ventilator. In many cases these are not of sufficient size actually to change the air below decks. They do allow a trickle of air to get down and sometimes there are reversed cowls or mushroom vents to let the air out again. As a means of preventing a closed hull from sweating they may be all right, but they do not assure enough fresh air for four sleepers.

As ventilation is also a matter of hull protection, means should be taken to assure a circulation of fresh air between ceiling and hull and beneath the floor. Every locker should have air holes or a woven grille. Where possible, lockers and other compartments should be fitted with curtains instead of doors and care must be exercised upon leaving the boat for any length of time that drawers and doors are left open a bit.

Particular care is necessary around the ice-box. In many boats this is a built-in fixture and there is a dead air space between it and the planking. I have known numerous instances in which the planking outboard of the ice-box was reduced to punk, although the remainder of the boat was sound.

Ventilation plays so important a part in the preservation of the health of the cruising party and in the prevention of rotting and warping of the hull that it seems strange that so little attention has been given the subject.

If obtaining fresh air cost a lot of money, most boats would be well equipped. But because air is free, and directing it to the place you want involves but little expense and but little ingenuity, it is usually given no consideration. Why not put in the next rainy day on the manufacture of a few windsails and, before time to hoist the anchor light, you will have the satisfaction of breathing some fresh air for a change? Even a square canvas wind deflector rigged above a hatch will sweeten the air and your disposition so that you will smile at the dub who rams your dinghy.

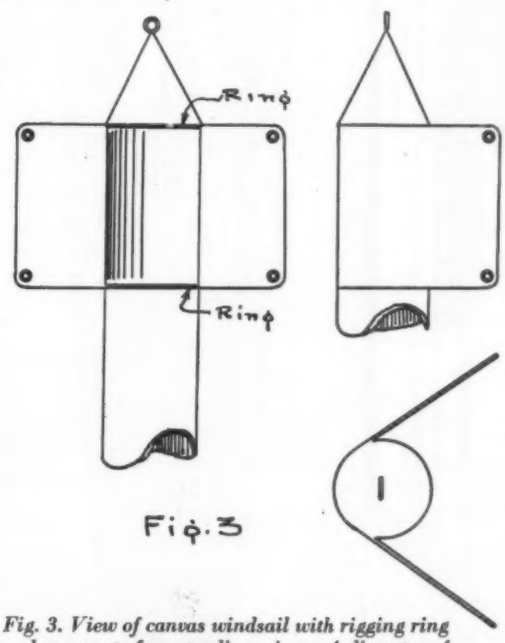
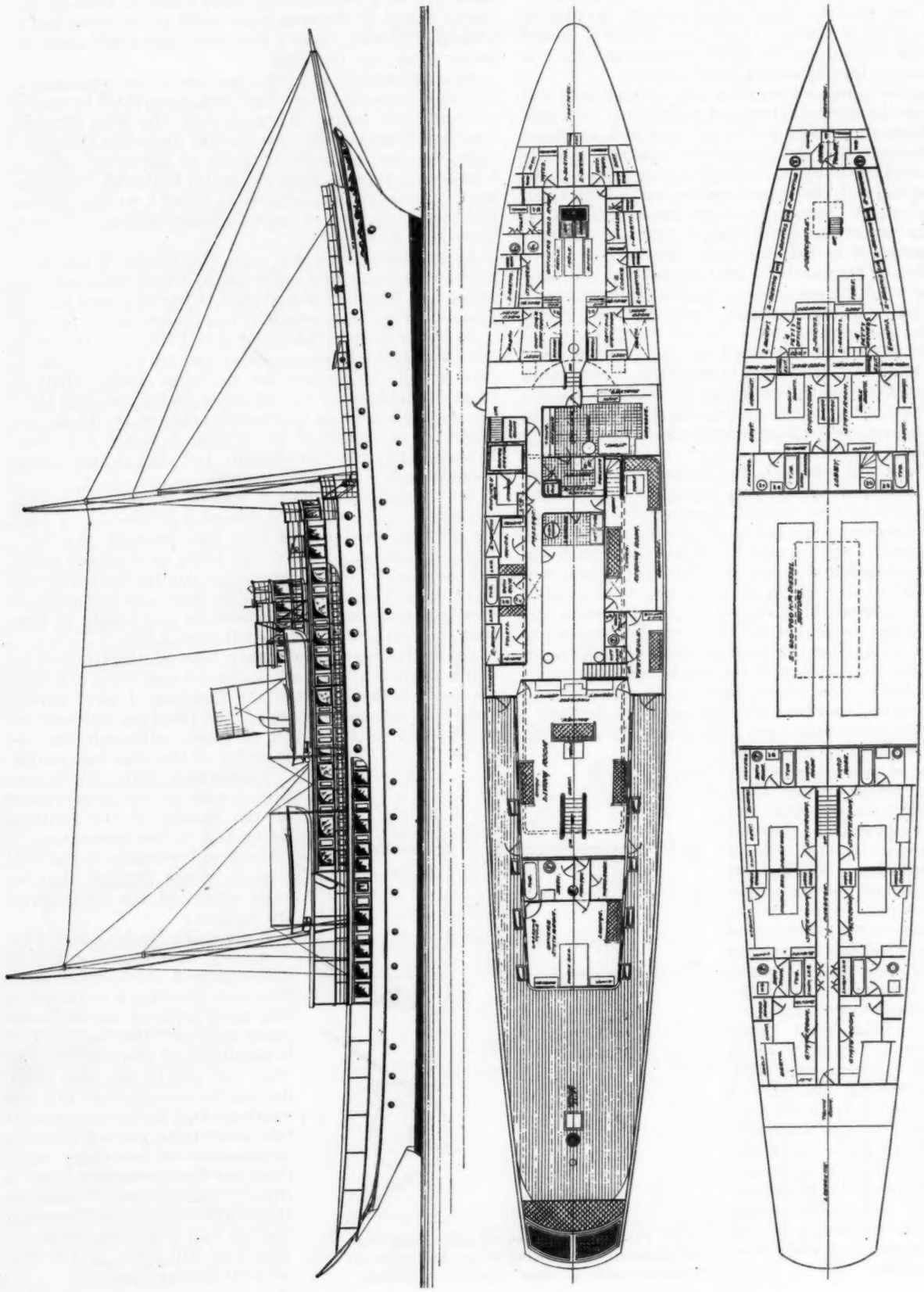


Fig. 3. View of canvas windsail with rigging ring and grommets for extending wings. A diameter of 6 inches would be about right for a 30-footer

A 206-Foot Steel Diesel-Powered Yacht of Distinctive Appearance



In designing the handsome twin screw Diesel-powered yacht whose plans appear above, Ralph E. Winslow has ignored the "modern" trend in the design of recent craft of this type and returned to the older clipper-bowed profile, with beautiful counter stern and sweeping sheer. This 206-footer is of steel construction, with twin Diesel motors of 700 horse power each, with tankage for a large cruising radius. She is of a distinctly seagoing type, with ample accommodations for owner, guests and crew for extended voyages to any part of the world. Up-to-date equipment of every sort assures perfect comfort both in port and at sea.

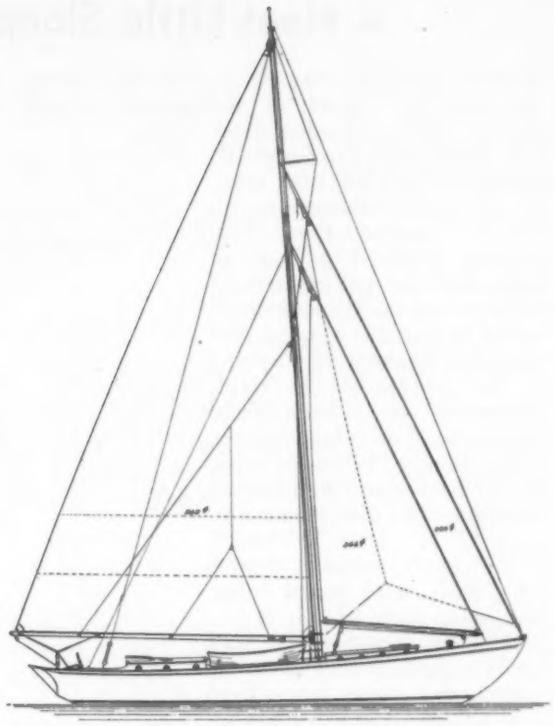
A Moderate Draft Sloop

FOR the yachtsman who desires to cruise all along the eastern coast, and take occasional trips around Chesapeake Bay and other comparatively shoal bodies of water, an auxiliary of moderate draft, but unquestioned seaworthiness, offers great possibilities. To meet such requirements, the sloop whose plans are shown on this page were drawn by Thomas D. Bowes, M.E., for a Philadelphia yachtsman to replace a much larger and deeper draft boat which required a large crew. Her dimensions are: l.o.a. 51′; l.w.l. 40′; beam, 15′ 6″; draft, 5′ 6″; sail area, 926 sq. ft.

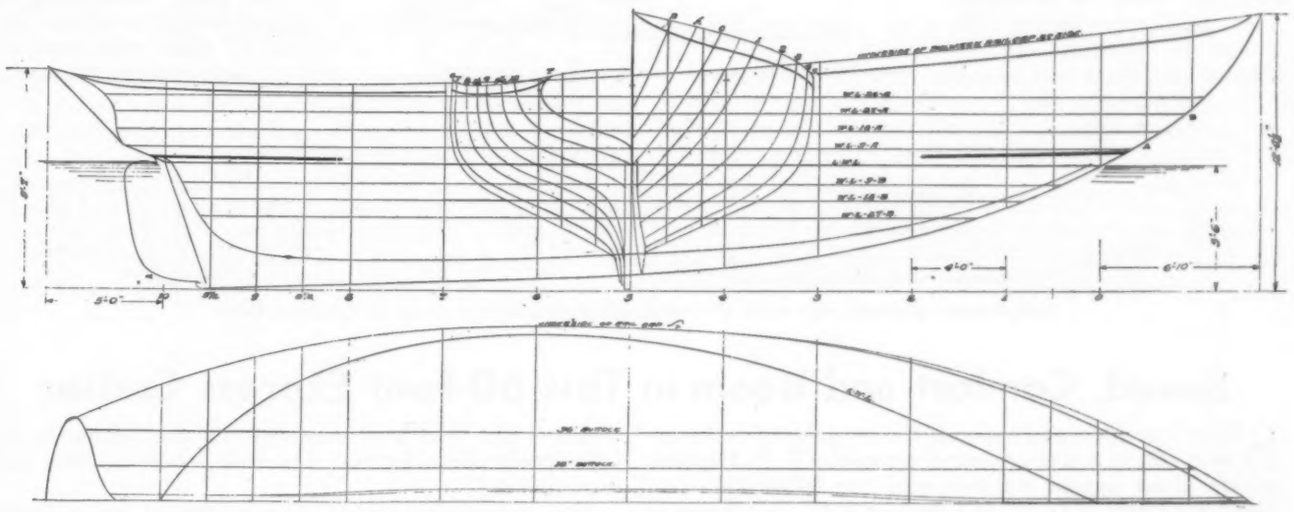
Ample beam and outside lead ballast assure plenty of stability, with an easy entrance with which to combat choppy head seas. The ends are moderate, sheer lively, and freeboard high enough to assure dryness and head room below decks.

The interior arrangement plan shows the main cabin aft, with two built-in berths and two extension transoms. A passageway leads forward, off which are entered a double and two single staterooms. A fine toilet room is placed just abaft the mast, the big galley is just forward of it, and the forecastle has two berths, crew's toilet, lockers, etc.

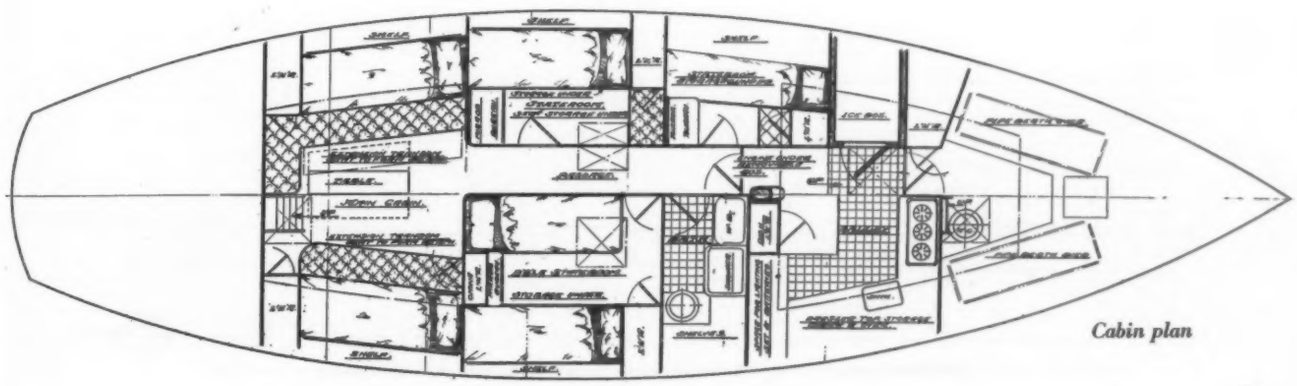
A Chrysler engine with reduction gear will be used for auxiliary purposes, and a small independent lighting plant installed to supply current for lights and electric capstan.



Sail plan



Lines and body plan



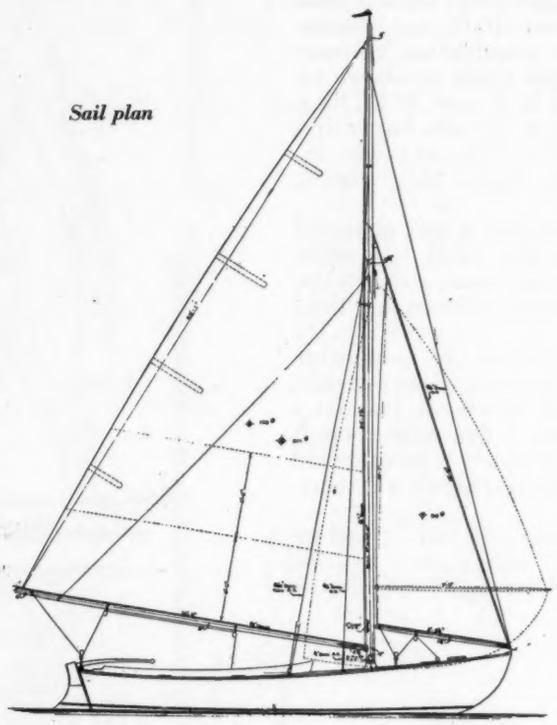
Cabin plan

A Neat Little Sloop for St. Lawrence River Use

THE accompanying plans from the board of Winthrop L. Warner, of Middletown, Conn., show a snappy little jib-headed sloop now being built for Ralph B. Britton, of New Britain, Conn., for use around Gananoque, on the St. Lawrence River. Mr. Britton required a boat of light draft for poking around in coves and shoal spots which would be capable of good performance in the rougher going in the middle of the river, wherefore the beamy, shoal draft type of hull was adopted, with a handy jib-headed sloop rig for both speed and ease of handling. The dimensions are: l.o.a. 17′ 11″; l.w.l. 15′; beam, 6′ 6″; draft, without board, 14″; draft, with board down, 4′ 1″; sail area, 211 sq. ft.

The lines and body plan show a shallow hull of ample beam, flat floors and hard bilges indicating great stability at a small angle of heel, an attribute much to be desired in a small day sailer. The rudder is outboard, for the sake of simplicity and ease of repair in case of damage of any kind. The entrance is easy and the run long and flat, so that she should slide along at a good clip under most conditions.

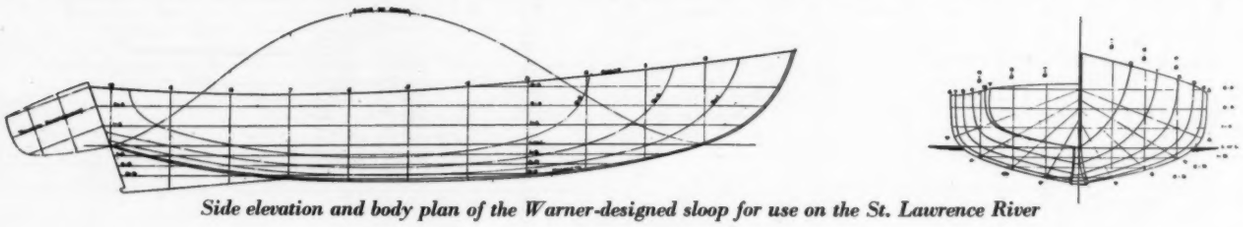
Sail plan



The jib has a boom the full length and works on a traveler, and as the runners will hardly be necessary in most weathers, she may be tacked without doing anything more than putting down the helm. The cockpit is quite roomy, so that as many as six people may be accommodated without crowding.

The boat will be lightly but strongly built, with Everdur bronze fastenings and hardware. Spars will be solid, with stainless steel standing rigging.

A shoal draft craft of this size and type makes an ideal small one-design class. In addition, it is an excellent boat for beginners, either old or young, as it is lively and quick on the helm, developing a "touch" which is seldom acquired by those who learn to sail in larger and heavier craft.

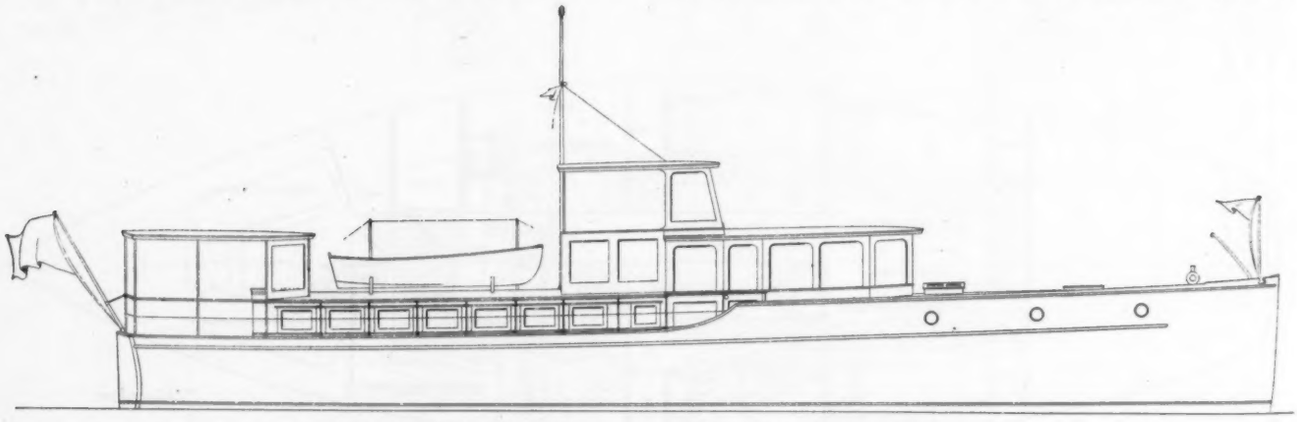


Side elevation and body plan of the Warner-designed sloop for use on the St. Lawrence River

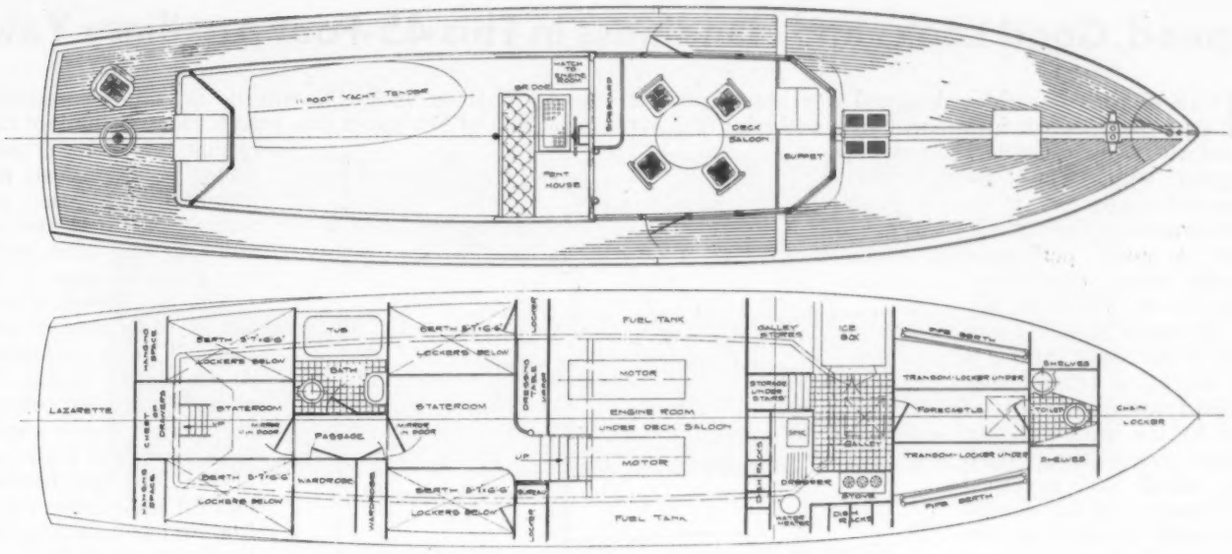
Speed, Comfort and Room in This 60-Foot Express Cruiser

SPEED, comfort and room are the keynotes of the handsome 60-foot day cruiser designed by P. L. Rhodes, whose plans appear on this and the following page. She has a beam of 13′ 3″ and draft of 3′ 6″, and powered with two 150 h.p. motors will step out at close to an 18-knot clip. She was designed for use primarily on Chesapeake Bay, for fast day runs, short cruises, and commuting.

The large deck saloon is surmounted by a flying bridge, from which the boat is controlled. Steps lead



Outboard profile of the 60-foot express cruiser designed by P. L. Rhodes



Deck and cabin plan of the 60-foot Rhodes-designed express cruiser

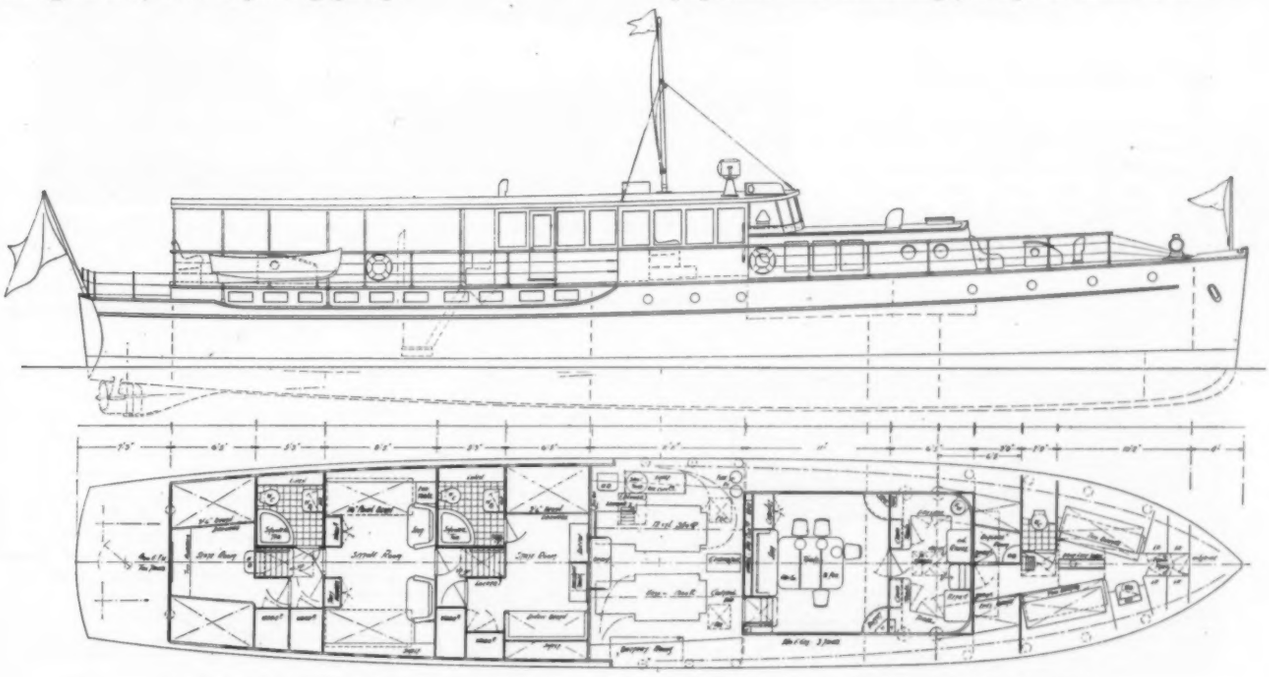
from the forward end of the saloon to the galley below, forward of which is a good forecastle for the crew, with toilet room, lockers, etc. Abaft the 'midships motor compartment are two double staterooms with passageway between, with bath room opening off the passageway to port, and wardrobe, lockers, etc., opposite. A permanent shelter top and glass front partially encloses the after deck, side curtains being provided for bad weather. There is a wealth of locker and storage space. Fuel tanks are in the well ventilated engine room.

A Speedy 88-Foot Express Cruiser by Kromholz

THE 88-foot power cruiser depicted below is a lot faster than she looks, according to Kromholz, her designer. She is planned to commute at 18 miles an hour and have a top speed of 24 miles with a pair of 12-cylinder motors, each developing 350 h.p. In addition to being fast, she has a lot of room below decks, including two double staterooms, each with bath, a sitting room with "in the wall" berths, and a commodious deck dining saloon, with adjoining galley.

When cruising, the "shore butler" becomes a member of the crew, so a stateroom is provided for him at the after end of the forecastle. The forecastle contains five berths, hanging lockers, etc., while the captain's cabin is opposite the deck lounge.

Hull construction is of a composite type employed successfully by Kromholz in previous boats. Although the hull is of heavy scantlings, the interior, including equipment and furnishings, is lighter than usual.



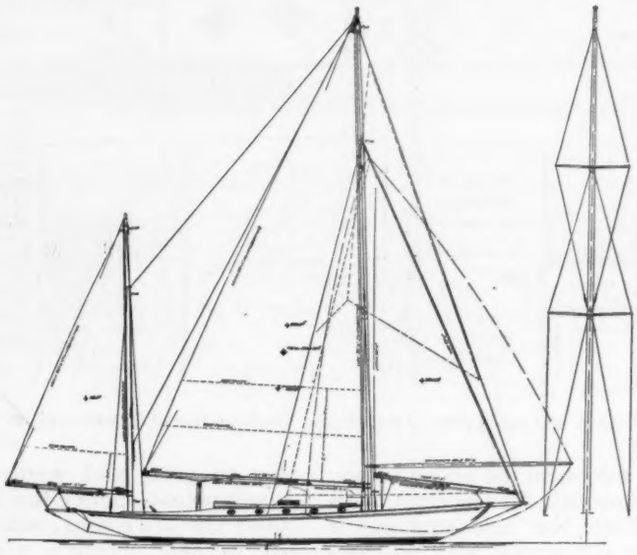
Outboard profile and interior accommodation plan of the 88-foot express cruiser designed by Kromholz

Speed, Good Looks and Handiness in This 45-Foot Auxiliary Yawl

THE plans of the Alden-designed yawl shown on this page were drawn for a client who wished a cruising yawl with simple gear and rigging, which would be exceptionally smart to windward in rough going, and a good performer under other conditions. She is 45′ 6″ over all, 31′ 6″ water line, 11′ beam and 6′ 10″ draft, and is a modification of the successful yawl *Nahma* turned out by the same designer some years ago. With her small and practical jib-headed rig she should be easily handled by two men on deck at any time.

The plans show a distinctly "yachty" craft, with nice ends and freeboard, sweet sheer, moderate beam and easy bilges. The fore and aft lines indicate a boat which will be slippery in almost any going, especially in a slop to windward, as specified by the owner.

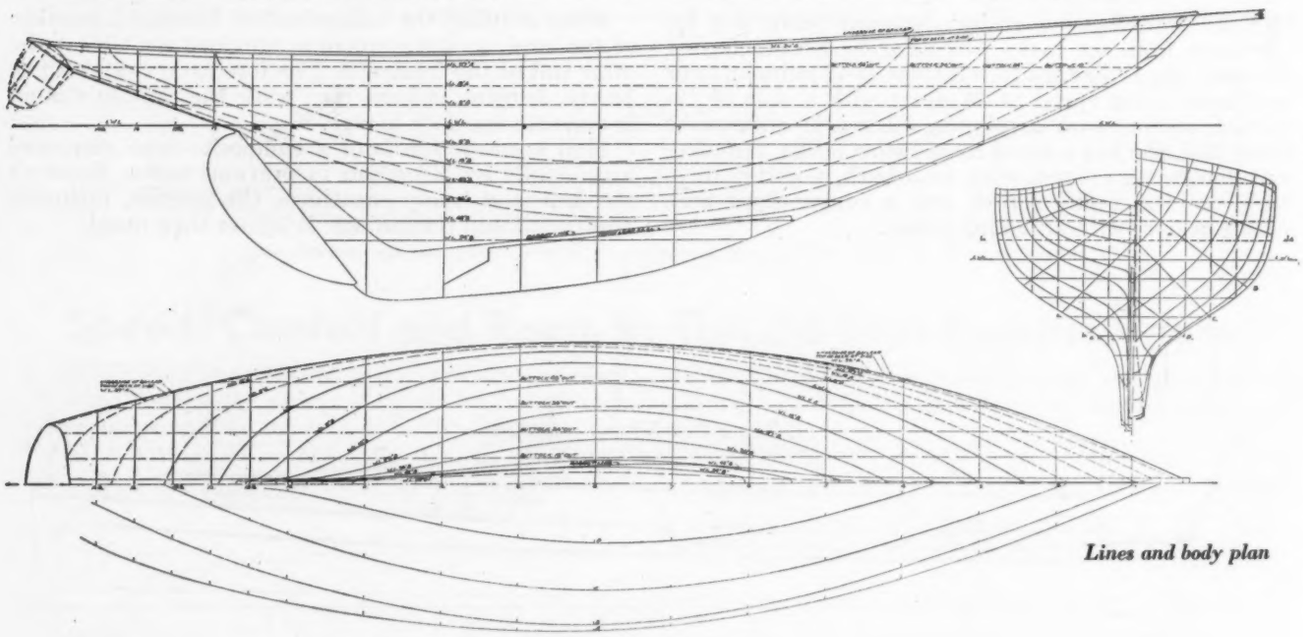
The cabinhouse is narrow, giving plenty of room to stow a boat on deck. The interior is quite commodious for a boat of her water line length, there being two nice cabins, good-sized toilet room, well-equipped galley and forecastle, and numerous closets and bureaus, besides other locker and stowage space.



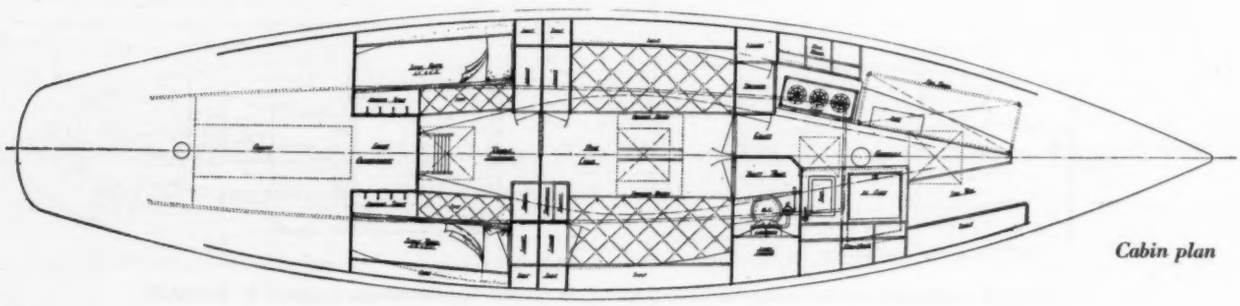
Sail plan

The rig is well stayed, the use of backstays being reduced to a minimum. A 4-cylinder motor, installed under the cockpit, is expected to give a speed under power of 7 knots or better. The specifications call for mahogany planking, bronze fastenings and hardware, lead keel, and all fittings of the best. Spars will be hollow, and sails of imported duck.

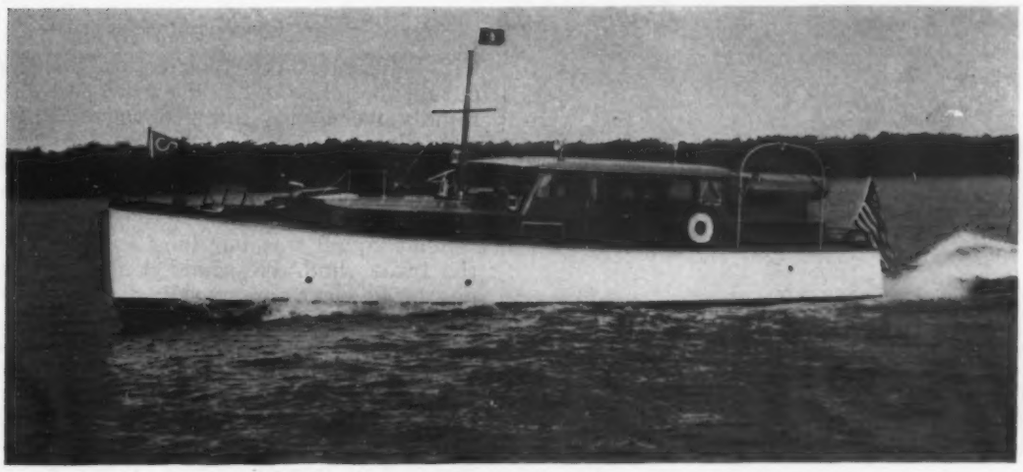
While this craft was not designed for racing, the hull looks decidedly speedy. The jib-headed yawl rig is not only fast to windward, but admits of using large light sails, such as a big Genoa jib, parachute spinnaker and different sizes of jib topsails.



Lines and body plan



Cabin plan



"Amelia II," a handsome Matthews 46-foot cruiser powered with a 225-h.p. Kermath, steps along at 20 m.p.h.

Of Interest to the Skipper

New Pigeon Boat Corporation

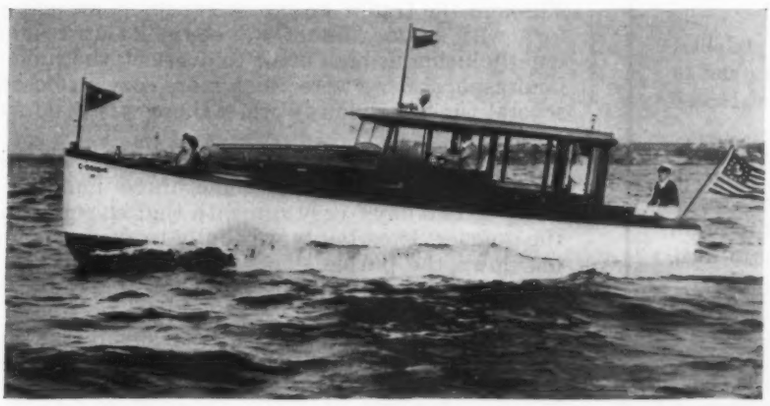
UNQUESTIONABLY of interest to the boating world is the establishment of the Pigeon Boat Corporation, with plant located at East Greenwich, R. I.

The officers of the new corporation are well known in the yachting world. Sam B. Dunsford is president, H. Ross Maddocks, a former prominent outboard driver, is vice president, while Roy Pigeon and Fred L. Pigeon, of the Pigeon Hollow Spar Co., are treasurer and secretary, respectively.

Captain W. J. Snadecki, designer and chief engineer, has been experimenting with high speed boats for many years. He raced the first step boats imported to this country from Monaco, and has lived to see some of his own patents expire on this type of boat. For the past twenty-five years he has been constantly working on the development of his ideal speed boat. This boat, now perfected, is that which is being offered to the boating world by the new corporation.

The corporation believes this boat will prove a positive revelation to the boating world for structural strength, seaworthiness, its exceptionally high speed compared to its engine horse power, its positively level riding — with or without a load — and the elimination of pounding.

The corporation manufactures a Class A runabout which has a speed of 40 m.p.h., selling for $1195, a Class B runabout, which maintains a speed of between 45 and 50 m.p.h. which will sell for $1295, and a Class C runabout having a speed of 40 m.p.h. which will sell for $1595. In addition, they are putting out a sailing dinghy which carries a list price of $297, complete with sail, oars, kapok bumper and a 4 h.p. outboard engine. This boat is an exceedingly fast sailing boat, such as is now being used by the Frostbite sailors, and will tow at 40 m.p.h.



Thirty-five feet of comfort for a party of six. A new Elco Cruisette with a speed of 15 to 17 m.p.h.

+ + +

Caille Outboard Motor Runs 1000 Hours Continuously

The first Caille Model "79" outboard motor to be built was put in a test tank for a breakdown test and has been running continuously for 1000 hours without showing any signs of wear, slowing down or loss of power. This motor will be kept running as long as it will hold together.

The motor has turned 180,000,000 revolutions and the propeller half as many. The Lynite piston has traveled 9,943 miles. If the motor had been on an ordinary row boat it would have traveled halfway 'round the world. An exact duplicate of this Caille motor can be had for $79.

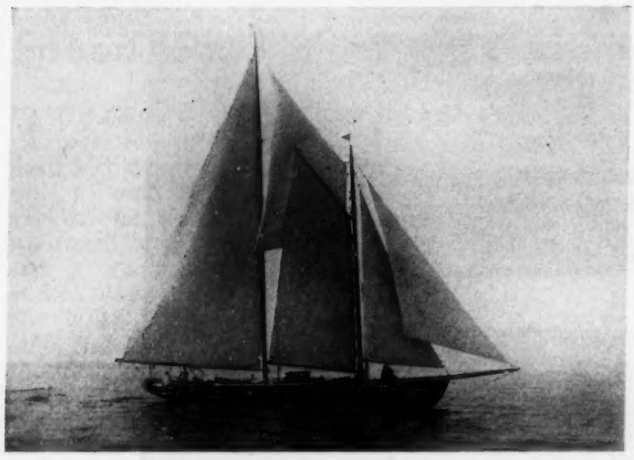
+ + +

Mower Opens New Office

Charles D. Mower, the well-known designer, who has been associated with a yacht building yard at City Island in the capacity of naval architect for several years, makes the announcement that he has opened an office at 205 East 42nd Street, New York City, for yacht designing and brokerage.

(*Continued on page 116*)

In this 21-foot 1932 Chris-Craft one can quickly leave shore cares behind



ZAIDA

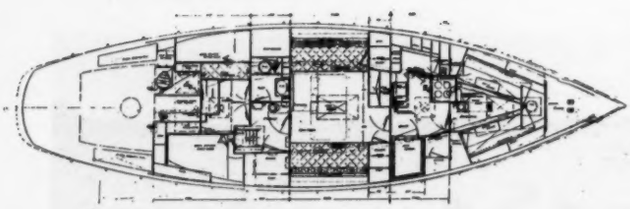
And Here's the Story of her Newest Sister

A typical Alden 52′ schooner now under construction at Lawley's yard. The ninth schooner from this design; a sister ship to "Zaida," Mr. Ratsey's schooner, which had the distinction of defeating "Malabar X" in two out of three races.

With a beam of 14′ giving great initial stability, this schooner will be comfortable to live in and to sleep aboard under way. She will have unusual speed both to windward and with started sheets.

Powered with a 45 h.p. Falcon with a 2-1 reduction gear, her speed will be 9 miles per hour. Last year a sister ship cruised through the West Indies to Brazil and return. Duplicates now building in Porto Rico, Australia and Canada.

This hull is adapted to other rigs. I should be glad to discuss your requirements with you.



Length over all, 51′ 11″; length l.w.l., 39′ 10″.
Beam (extreme), 14′; draft (extreme), 7′ 2″.

John G. Alden

Naval Architect — *Yacht Broker*
148 STATE STREET — BOSTON, MASS.

Initiation

(*Continued from page 42*)

with half a gale on the quarter, and floods of rain seeking out all the joints of our oilers, while the early dusk fell rapidly over a very tumultuous sea. Then, through the tight-closed companion, barely audible in the roar of wind and water, came a faint musical tinkle — the call to afternoon tea. What a sound in such a scene — but the tea was mighty good!

That squall was our long expected introduction to the trade wind. We scudded all night, and the ninth day broke clear and sparkling, with a strong northeast wind and a long and growing swell. The yacht swung and swooped, but ran easily and kept quite dry for the most part. The brilliant indigo sea shouldered itself up against the sky on all sides in great sliding mountains, their sides all wrinkled and ruffled by the little waves, their summits usually crowned by a gleaming cap of foam. And it was *warm* — I had a delicious douse-bath on deck. The sun was certainly a joy that day, clear, sparkling and hot. All sorts of duffle appeared on deck for a good drying out. No water had leaked into the cabin, but it was impossible to pass such a squally week at sea without introducing a general insidious dampness into the tightest of living quarters.

There was, of course, no difficulty about sights, and our position was accurately fixed; in fact, the skipper and I agreed to a hair — an extraordinary thing on a small boat. We were accordingly ready to go anywhere, confident alike in ourselves and in the boat, which had given a perfect performance; though we had no storms, we did have brisk winds, fierce squalls and pretty lively seas. In fact, it is not the great swells which trouble small craft, anyway, but rather the intermediate waves. Through the trades we ran in sweeping, swinging comfort, with 15- or 20-foot waves rolling up behind and quietly lifting us high in air to overlook the ruffled blue landscape, and we were much more cozy on board than several times previously when there was little swell to be seen.

Being now at 64° west longitude, we headed nearly south for Virgin Gorda, some three hundred miles away — two days' easy run with that splendid wind on the quarter. It certainly was bully to swing along, roaring down the purple slopes, and know that our plans had worked, and that the problems of the cruise were solved.

The tenth day was just a long steady run through the crisply ruffled blue — a swing and a dip, a rush and a roar, with the white foam flying, the taut cordage singing, and the glorious sun beaming. Good sights again, of course, and near enough to Virgin Gorda to set four o'clock the next afternoon as the time to begin looking for its blue mountain top ahead. We could lay our course and count on our distance almost like a steamer before this noble wind.

This glorious run ended on the afternoon of the eleventh day, when one of us went on deck just to see whether there was anything in this talk of sighting land at that hour — and there, right ahead, was a faint blue peak against the blue sky. Virgin Gorda, right on the nose, in spite of a dubious current this last day. Of course we expected it; nevertheless we were all glad to see our plans carry through so perfectly.

Then all was animation. Everybody "sat up," and took a look at that bit of mother earth. Strange that it should seem momentous simply because we had not seen land for eleven days! Our course was changed well to the westward to clear the broad coral banks reaching out to Anegada, far north of Virgin Gorda and much nearer to us, but so low as to be visible only a few miles.

It was all most convenient. Having had full daylight

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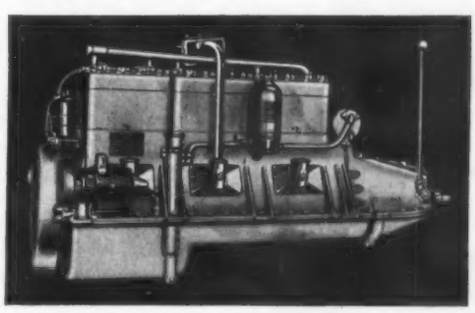

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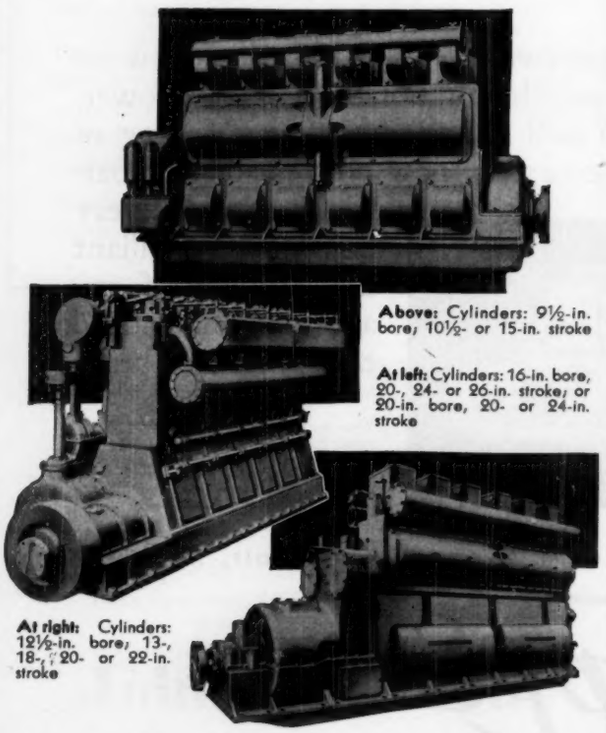


Above: Cylinders: 9½-in. bore, 10½- or 15-in. stroke

At left: Cylinders: 16-in. bore, 20-, 24- or 26-in. stroke; or 20-in. bore, 20- or 24-in. stroke

At right: Cylinders: 12½-in. bore, 13-, 18-, 20- or 22-in. stroke

Above types are made with 6, 8 or 10 cylinders, affording a wide range of capacities up to 1600 h.p. Many are made also with light weight aluminum parts to permit high-speed operation.

for our landfall, we entered the Virgin Passage after dark, when its good lights were ideal landmarks. All was broad and open. We picked up the splendid Culebrita Light in due course, headed for it until little Sail Rock, in mid-channel, came east of south, brought the latter close aboard, and then headed east along the south shore of St. Thomas.

It was a noble sail, and all the more charming for being leisurely. The last eastward leg of ten miles or so to the harbor faced us into the wind, here mild and friendly in the lee of the islands, but there was no object in arriving before breakfast time, so we continued under sail alone, agreed that this was the proper way to enter the famous and beautiful harbor. This was in the morning watch, my watch below, but there was little sleep for any of us as we closed in on the rugged mountains which loomed high and mysterious against the starry northern sky.

The sea, as well as the wind, was gentle here — a mild and friendly bobble, just enough to remind us that we were not yet actually in harbor, and a total contrast to the tumbled hills of white-crested indigo on which we had danced for several days.

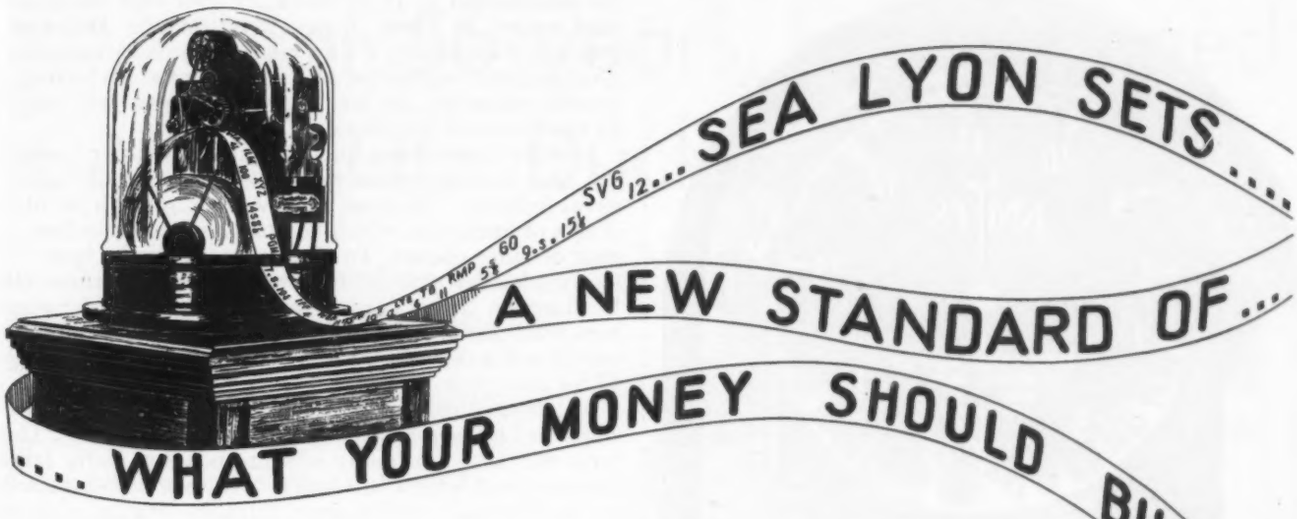
As we worked eastward the sky ahead imperceptibly brightened, the stars lost the sharpness of their brilliance; dawn was coming. A faint flush of rose and lemon lit the horizon, a few high scattered flecks of cloud caught the still invisible sun and flamed crimson — and the night was over.

Meanwhile the gaunt flanks of St. Thomas had hardened from shadowy silhouettes to ruggedly molded and intensely solid mountains, their valleys veiled in morning haze, their crests and ridges delicately tinged with the soft colors of the sky. As yet there was no sign of humanity save one offshore lighthouse — no towns, no houses, no sign of cultivation; to all appearances we might have been the discoverers of a wilderness island, and we thrilled with a touch of the ecstatic joy of the pioneer. That approach to St. Thomas in the growing dawn made us all for the moment cousins of Columbus.

As we opened up the harbor entrance the street lights were still twinkling — a bright network flung loosely over three hills, the whole outlined against the dark mountainside. But before we entered the sun was a low red ball blazing across the eastern waves, the street lights were gone, leaving the town scarcely visible, and even the harbor lights had winked out; the only signs of life were a few fishing boats working out under sail, along the distant rocky shore. We sailed up the well-marked channel in that breathless hush of suspended animation which comes to towns between night and morning.

It ended in the appearance of a small launch with the deputy harbor master, a gentleman of immaculate dress and very dark complexion, who welcomed us, inspected our papers, and assigned anchorage. We quietly rounded to, dropped the jib, and let go the small anchor, which had last tasted bottom in Pamlico Sound. The canvas was stowed, the stops were tied, and the little white yacht lay at rest in the silent, beautiful harbor.

It was like a dream — nay, it *was* a dream, fulfilled. And in that peaceful and lovely haven our whole momentous voyage looked amazingly simple. We just sailed out from Cape Lookout and headed east and south for eleven days, spending an unreasonable amount of time on observations, and there was St. Thomas! A dream fulfilled — and as the strange life of this far island began to make itself seen and heard about the streets and wharves it came home to me that we had actually "gone furrin"; that we had trusted the sea and found it kind, that I had accomplished my initiation.



NEVER before has opportunity knocked at your door offering such outstanding value as in Sea Lyon runabouts. Perhaps never again will you have an opportunity to buy a latest model Sea Lyon at the present low prices. NEW boats — 1932 models! Not distress merchandise, but the latest in runabout design and comfort, the finest in materials and craftsmanship and the last word in performance.

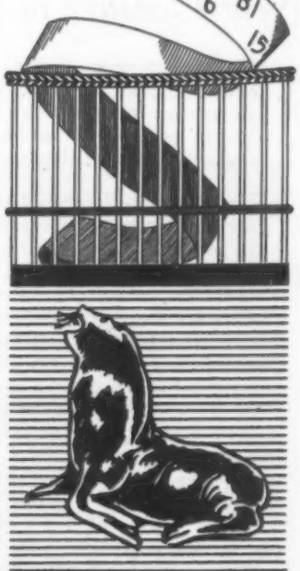
Savings in material costs, labor rates and overhead, elimination of commissions, trade discounts and showroom expenses are passed on to you in the latest price reductions of the new Sea Lyon. These savings make your 1932 investment in boating more secure in a Sea Lyon than in any other craft. Don't buy any boat until you first drive a Sea Lyon, — then compare price, quality and performance. Prompt action is essential to insure early delivery. Prices subject to upward revision without notice.

Five Models

35 to 52 Miles Per Hour

24′	**Sea Lyon**	**125 H.P.**	**Chrysler "Imperial"**	**35 m.p.h.**
28′	**Sea Lyon**	**225 H.P.**	**Kermath "Sea Wolf"**	**44 m.p.h.**
28′	**Sea Lyon**	**325 H.P.**	**Lycoming "Twelve"**	**52 m.p.h.**
30′	**Sea Lyon**	**225 H.P.**	**Sterling "Petrel"**	**42 m.p.h.**
30′	**Sea Lyon**	**300 H.P.**	**Hall Scott "Invader"**	**48 m.p.h.**

Write Today for 1932 Prices



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Kenyon Marine Speedometers Add New Pleasure to Boating

In the last year nautical knowledge has registered another great advance. Gone are the days when yachtsmen could only inexactly state that they were going "pretty fast," or hazard a guess that they were sailing "as fast as they could."

The recently perfected Kenyon Marine Speedometers and Logs give new pleasure and genuine satisfaction to yachtsmen through their ability to record the exact speed of their boat at any moment, to show when they are securing maximum speed, and to register the distance covered. It is fascinating, indeed, to note the speed of your boat in different winds, on different courses, with various sails and sail settings.

Kenyon Marine Speedometers are offered in models for both sail and power boats. Complete details are supplied in our booklet that will be sent you upon request.

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564 East First Street Boston, Mass.

Sales Agents

KELVIN & WILFRID O. WHITE COMPANY
112 State Street Boston
38 Water Street New York

"Lenore II" — Something New in Express Diesels

(Continued from page 52)

she measures 114 feet, with 19 feet beam and 115 tons displacement on 5 feet 9 inches draft. With two 8-cylinder Bessemer engines of 600 rated h.p. aggregate, she was clocked at 18.12 miles per hour over the measured course at Deep Water Point in the Delaware, opposite Wilmington. With a moderately sharp entrance, good deadrise amidships, and a very flat stern having a knuckle chine aft, she was found to perform well under all conditions of weather and water.

In order to develop a hull form not only easier to drive but also less expensive to construct, especially aft, a naval architect, Thomas D. Bowes, prepared a number of sets of lines from which he finally selected the best in each of three classes. To these three forms he built 14-foot models for towing in the experimental basin at the Washington Navy Yard, where they received the numbers *2882*, *2883*, and *2884*, respectively. These are illustrated in Fig. 1, with the addition of the form of *Waleda II* for comparison.

No. 2882 shows a sharp entrance, good deadrise amidships and a sharp afterbody increasing in deadrise. This form was based on many offshore boats of fairly large displacement which this naval architect had designed.

No. 2883 had a still sharper entrance forward, slightly sharper deadrise amidships and a very broad, flat stern. It is a derivation from the Bowes gasoline express cruisers and is reminiscent of the Taylor form in the U. S. Navy destroyers.

No. 2884 was an entirely new development with a full forebody, the fullness of which is carried well forward and then snubbed. Amidships, the deadrise is a little fuller with a slightly harder turn of bilge, and the stern is much narrower, with considerably more deadrise than in form *No. 2883*. The after buttocks run out fairly straight and flat, because of the depth at the center of the transom.

Resistance curves plotted from the model tests in the Washington tank (see Fig. 2) demonstrate the newly developed form to be the most easily driven of the three, even though it has not the least wetted surface and thus not the lowest skin friction.

Its superiority over the others accrues from its lower wave-making resistance. It possesses, too, the advantages of having a greater internal capacity than either of the others and of being an easier and cheaper form to build. Moreover, it has produced better sea boats than those of the other two forms.

Sirene, designed by Mr. Bowes for John Jacobs of Philadelphia, was the first Diesel express cruiser built to this new model. A boat 87 feet long on the waterline and 16 feet in beam, she displaces about 97,000 pounds on a draft of 4 feet. Driven by two Treiber Vee-type 12-cylinder engines, delivering together about 560 h.p., she made a mean speed of something over 24 miles per hour over the measured mile. *Sirene* was a 1929 boat.

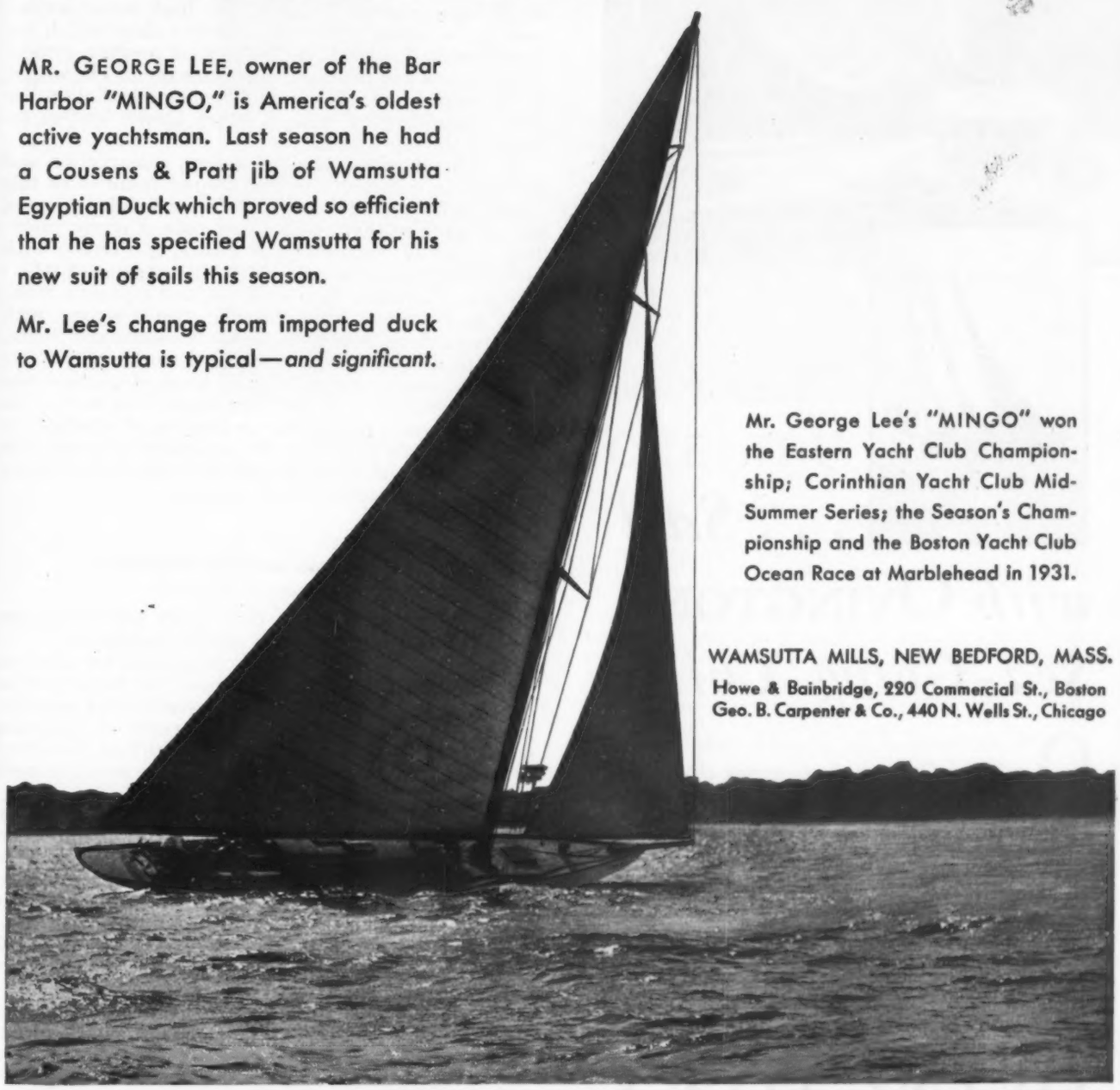
Normada, which followed her in 1930, was a boat of 118 tons displacement, built for James Carstairs, of Philadelphia. Her waterline measurements were 115 feet 6 inches length and 20 feet beam, and her draft was 5 feet 2 inches. With two Treiber Vee-type 12-cylinder motors, totaling 760 h.p., she rendered a mean measured speed of 21.37 miles per hour.

Between *Normada* and *Waleda II* one may get an idea of the gain due to the improved hull form. The displacement and load waterline length of the two are practically the same. Yet with 760 h.p. and her displacement unaltered, *Waleda II* could have attained only 19.12 miles per hour, contrasted with *Normada's* 21.37 miles per hour. The gain of 2.25 miles per hour has been won purely in the hull lines.

MR. GEORGE LEE, yachtsman for 56 years, has changed to Wamsutta Duck

MR. GEORGE LEE, owner of the Bar Harbor "MINGO," is America's oldest active yachtsman. Last season he had a Cousens & Pratt jib of Wamsutta Egyptian Duck which proved so efficient that he has specified Wamsutta for his new suit of sails this season.

Mr. Lee's change from imported duck to Wamsutta is typical—*and significant.*



Mr. George Lee's "MINGO" won the Eastern Yacht Club Championship; Corinthian Yacht Club Mid-Summer Series; the Season's Championship and the Boston Yacht Club Ocean Race at Marblehead in 1931.

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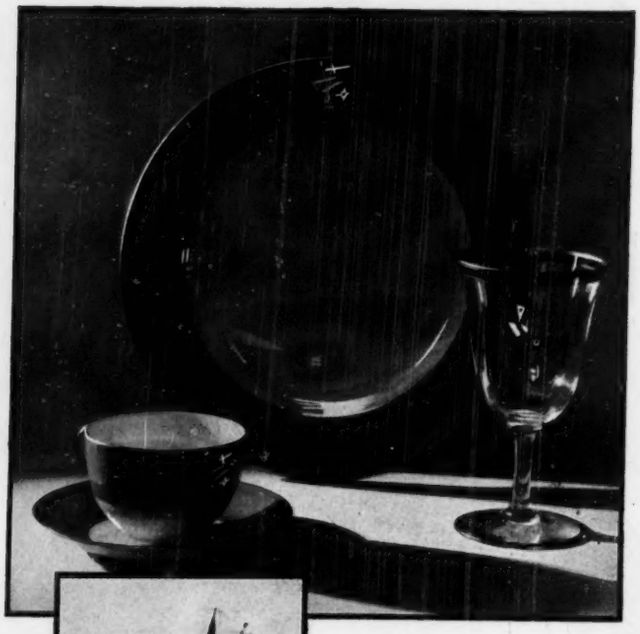

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Latest of this line is *Lenore II*, built last year to the order of Sewell L. Avery, of Chicago. On a waterline length of 90 feet 8 inches, beam of 15 feet, and draft of 4 feet 9½ inches, she displaces 143,500 pounds. Her engines are a pair of Winton 8-cylinder Diesels delivering together 1000 h.p. She has made a speed of about 24¼ miles per hour.

In the installations of this line of boats a progressive pruning of weight has been achieved. Partly, this has been due to progress in the Diesel engine art. From the earlier engines of *Waleda II* to the latest engines of *Lenore II* there has been a weight reduction from 27 pounds per h.p. down to 15 pounds per h.p. Partly, too, the weight of the plumbing has been cut down by using small high-pressure tubing on the fresh water service and by installing individual electric toilets, which are considerably lighter than the central pressure system with its tank and pumps in the engine room. The weight of the heating, ventilating and cooling installation has been diminished by using a return blower system instead of the piped radiators.

By making every detail of design, construction and installation contribute to the desired result — as this narrative has broadly outlined — a sum total of progress can be attained that opens a new vista of power yachting. *Lenore II*, primarily and finally, is a cruiser with three double staterooms — each with separate bath — two saloons, roomy flush deck aft, and captain's room, crew quarters and galley forward. She is strong, with full strength, as demonstrated by *Normada* and *Sirene*, the hulls of which show no signs of working after two and three seasons of service in all kinds of weather. She is a good sea boat — in the strict sense of the word — an able coastwise cruiser. Not a fraction of strength or ability has been yielded to the attainment of speed. She is a type that undoubtedly will influence future design in extreme high speed Diesel cruisers.

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Gasoline Tanks and Their Installation

(*Continued from page 81*)

water and dirt can settle, then many gallons may be drawn out before the foreign matter is removed.

This water of condensation is responsible for a curious form of corrosion sometimes seen at the bottom of an old tank. Some gasolines have a weakly acid reaction, and water seems to have the property of becoming slightly acid after long contact with such fuel. The drops of water collecting at the bottom eat the metal in small pitted holes almost like smallpox marks.

To leave this subject without speaking about the tank saddles and straps would be omitting an important part of a tank installation. In the 150-mile Sweepstakes Race at Detroit in 1926, *Cigarette IV*, leading at 50 miles, went out shortly thereafter with a broken tank saddle which let the tank go adrift. And *Miss Syndicate*, the leader at 100 miles, broke a tank saddle on that lap and lost so much gas that she was out of the race thereafter.

Saddles for high speed boats should be substantial, for the weight of the tank is increased many fold due to the impact of pounding. Cast or forged metal saddles supported by the main girders of the bottom have proved to be the most satisfactory for standing up under a hard test. Tanks should be held in the saddles by strong straps which can be securely clamped around them. When cylindrical tanks are used it is advisable to line the straps with brake lining and then set everything up tightly in varnish so that there is no chance for the tank to get adrift. One point to note about the straps is that the bolts, which are set up to tighten them around the tank, should pass through heavy lugs riveted to the bands.

An Old-World Atmosphere in a Gorgeous Mountain Setting

MANOIR RICHELIEU

at Murray Bay, Province of Quebec

WAKING at dawn with the scent of balsam and the tang of the sea filling your bedroom, you may watch the serene light of the sunrise transforming the vast reaches of the St. Lawrence River. That gilded, becalmed schooner might be Jacques Cartier's "*La Grande Hermine*" lying-to in the bay—the thought belied by the faint plume of smoke from a distant ocean greyhound headed for Quebec. Several slender yachts are anchored beyond the wharf, their brasswork gleaming like new gold.

At the breakfast table—the river you caught sleeping now defiantly blue, its waters dancing beneath the opened casements—you plan your day. A round on the famous Manoir links, high up in the hills, or a few sets of tennis on wonderful *en-tous-cas* courts, followed by a plunge in the large outdoor swimming pool where at noon-day fashionable Murray Bay foregathers. In the afternoon, perhaps a drive in the picturesque countryside or a gallop through wooded bridle paths before dressing for dinner. Later, dancing, and a stroll on the terrace beneath the stars and the pale flicker of the northern lights.

We would like to send you an illustrated booklet describing this northern paradise in French Canada. A pamphlet entitled "*Freedom from Hay-Fever at Murray Bay*" may also interest you or a friend. Both will be mailed gladly on request.

***The* COST . *The* DISTANCE . *The* TIME**

The return summer railway fare between New York and Montreal, a ten hour journey, is $22.42 ...lower berth, both ways, $7.50. From Montreal to Murray Bay by steamer, a sixteen hour sail, and return, is $29.80, meals and berth included. Murray Bay may also be reached from Montreal by rail or motor. MANOIR RICHELIEU Rates: American Plan, one person, $10.00 to $15.00 per day; two persons, $20.00 to $28.00 per day. Special rates by the month or the season. Every room with private bath. Sitting room suites available

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Prices F.O.B. Factory at Bath, Maine

Diameter	*Two Blade*	*Three Blade*	*Extra Board & Key Seated*
8″	$ 4.50	$ 6.50	$ 1.40
9″	4.75	7.25	1.40
10″	5.00	8.00	1.40
11″	5.50	8.50	1.50
12″	6.50	9.50	1.70
13″	7.50	10.00	1.80
14″	8.50	11.00	1.90
15″	9.50	12.00	2.20
16″	11.00	14.00	2.20
17″	11.50	15.00	2.50
18″	12.00	16.00	2.50
19″	14.50	19.50	2.75
20″	17.00	23.00	2.75
21″	18.50	27.50	3.10
22″	20.00	32.00	3.10
23″	22.00	35.50	3.50
24″	24.00	39.00	3.50
25″	27.00	42.50	4.00
26″	30.00	46.00	4.00
27″	34.00	51.50	4.60
28″	38.00	57.00	4.60
30″	46.50	62.00	5.10
32″	52.00	70.00	5.80
33″	56.00	75.00	7.00
34″	59.00	79.00	7.00
35″	62.50	83.50	8.00
36″	65.00	87.00	8.00
38″	80.00	104.00	9.40
40″	100.00	134.00	10.70
42″		144.00	13.50
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If there is no HYDE dealer in your locality, or if you are unable to obtain what you require, send your order direct to the factory. It will receive prompt and careful attention.

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A copy of our booklet, "*Propeller Efficiency*," will be mailed without charge. It illustrates all of the HYDE PRODUCTS.

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Why Not Charter?

(*Continued from page 63*)

evening we moved around into Linekin Bay, than which I firmly believe there is no lovelier anchorage this side of paradise.

From Linekin we worked westward along the shore line, living off the land (and sea) in a fashion fit for a king. We dug bushels of tender soft-shelled clams from the teeming mud-flats, bought fresh-caught lobsters (at 15 cents a pound) from the fishermen, new sweet corn and broilers from the farmers, and did a bit of fishing on our own besides. Our itinerary, which seemed to grow more or less extemporaneously, included a run up the New Meadows River to Cundy's Harbor, the Basin, and Winnigance Bay, then westward again through the tortuous but fascinating waterways of Casco to South Harpswell and the Portland district. And all this time the weather held perfect, with days of dazzling blue and gold, and nights of moonlit glory.

Indeed, the day we left South Harpswell to start for home waters gave the only poor weather of the entire trip. By midnight, however, the skies were clear again, so we pulled out of Portland Harbor, into which we had run for provisions, and headed down the coast.

After spending several days visiting friends at Cataumet and the Vineyard, we finally admitted that our time was getting limited; so we made our regretful adieus and moved on. The following afternoon we dropped into Madison, Connecticut, for a visit with old friends; and the next day, with the last of our series of northerlies already beginning to fade, we ran down to Greenwich and wrote finis to the finest cruise we have yet taken.

And as fine as it was, that entire *Carlsark* episode, from start to finish, was one of the cheapest nautical experiences we have ever had. The boat was so fully found when we received her that we had nothing to buy but our own provisions. With the charter and pre-cruise expenses totaling $650, and the trip itself adding another $175, we had a bill of just $825 for one and one-half months of ownership, or $165 apiece. That figure, for any similar boat, can certainly be equaled and probably bettered this summer, so if you want to forget the Depression for several weeks, go ye and do likewise. You'll find the yards cluttered with good boats, and you'll find plenty of owners amenable to chartering for a month or so — and the salt water and blue sky is yours for the asking.

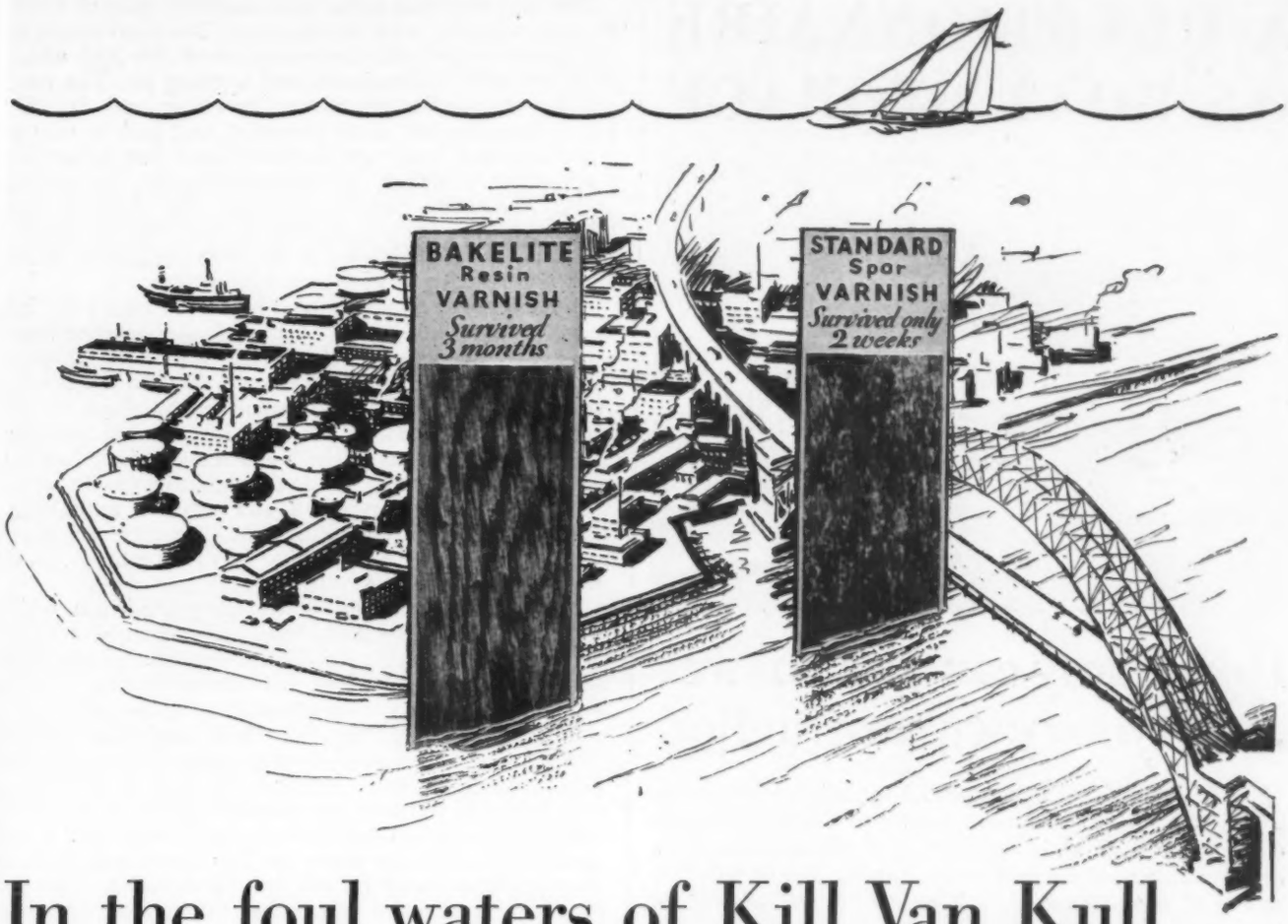
\+ + +

"Viking" Beats American "Sixes"

(*Continued from page 70*)

American boats were the *Nancy*, the *Bob Kat*, owned and sailed by Robert B. Meyer, the *Lucie*, belonging to Briggs S. Cunningham, and the *Jill*, belonging to Seward Johnson. They were thus, perhaps, the best of our Atlantic Coast "Sixes." The series was not a team match, the boats racing on the point system for the possession of the Prince of Wales Cup.

The weather for the four days of racing ran the whole gamut from a light breeze to a southerly gale, and thus offered an opportunity to try the boats under widely varying conditions. But through it all, there was apparently no chance of stopping Trimingham and *Viking*. The course sailed was something of a novelty in racing courses and has much to recommend it, as it combines the merits of a windward and leeward course with a triangular one in each race. It consisted of a 2¼-mile leg to windward and return, another beat back to the first windward mark, and thence around the rest of a triangular course, giving two reaches, the whole distance being about ten miles.



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CONTAMINATED by acids, oil, alkalis, and sewage from the factories that line it shores, the waters of the Kill Van Kull provide a tough proving ground for marine finishes. Yet this is the place a varnish maker chose to prove the worth of Bakelite Synthetic Resin finishes. Result: a fine "spar" lasted two weeks, and Bakelite Synthetic Resin varnish only began to show signs of disintegration at the end of three months!

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Not only are Bakelite Resin Finishes unusually durable under exposure to extreme weather conditions in both winter and summer but they are most economical. Although their solid content is greater they brush on very easily. A given amount will go farther or will give a heavier coat. They retain their brilliant lustre for an exceptionally long time.

The leading paint and varnish makers are producing Bakelite Resin Finishes and they are obtainable at shipyards and dealers everywhere.

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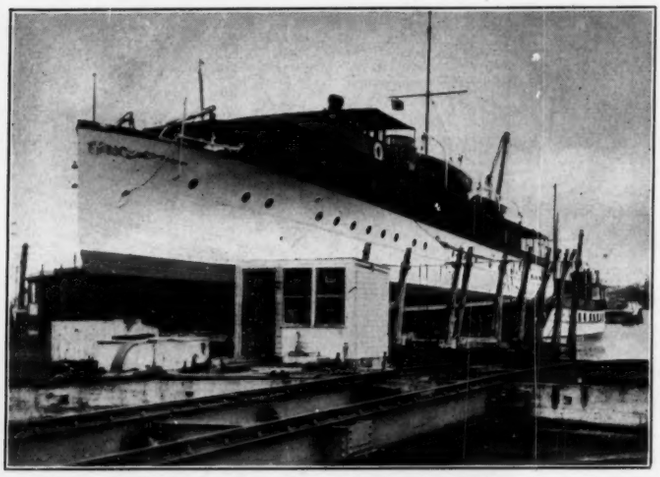

How many can you answer . . . to your own satisfaction

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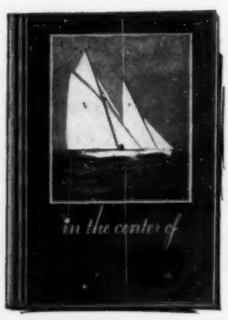
Our business has more than doubled in the last few years. There must be a reason. There is a reason. We operate on a business basis. Our Crandall hauling and launching equipment is the best obtainable. Our men are skilled. We handle commercial as well as pleasure craft, and have no inflated ideas as to prices. All bills are itemized. Write for booklet on winter storage.



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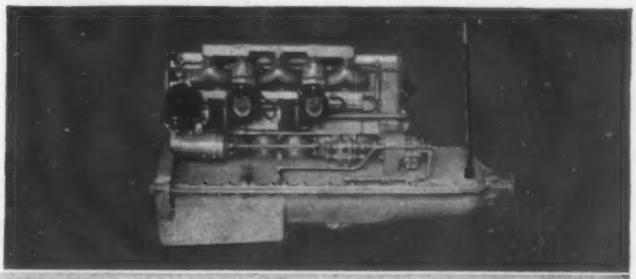
The first race was sailed in a southerly gale of about 40 miles straight, with blinding rain. The start found all the yachts reefed with the exception of *Bob Kat*, which came out with full mainsail and working jib. The wind was too strong for full canvas, however, and *Bob Kat* lost a spreader just after the start and had to return. *Viking* carried away her jib sheet block just before the start, which made her one minute and a half late getting away. *Lucie* also had trouble and was three or four minutes late in getting started, so that *Nancy* and *Jill* had a battle of their own in weather conditions which were trying alike to yachts and crews.

In hard going *Nancy* proved herself to be a very fast boat. Unfortunately, she overstood the weather mark and *Jill* rounded ahead of her, while *Viking* was thus enabled to work into second place. On the run down wind *Nancy* passed *Viking* and regained second place. On the second beat to windward the wind increased in force but the relative positions of the boats remained unchanged, although *Viking*, with her double reef, seemed to be going very well. *Jill* rounded the weather mark first, *Nancy* second, *Viking* third. Their positions remained unchanged on the two reaching legs to the finish. *Lucie* was fourth and *Achilles* fifth.

The gale blew itself out before the second race, which was sailed in a moderate to fresh breeze ranging from 13 to 18 miles' strength. *Viking* got the best of the start after Pearman, in *Achilles*, had forced *Nancy* over the line before the gun. *Viking* was having the best of it on the windward leg until the fleet split and Trimingham tacked to the westward to stay with *Nancy* and *Jill*. The boats on the other tack got the best of the breeze, and *Bob Kat* rounded the weather mark in the lead, followed by *Lucie*. Going down wind *Viking* used a new parachute spinnaker made on the Curry principle by George Ratsey and loaned for the occasion. This sail proved very effective and pulled *Viking* from fourth to second place on the short run, only a length behind *Lucie*. On the wind again, *Viking* went into the lead and kept her advantage on the two reaches, finishing thirteen seconds ahead of *Bob Kat*, which had been in the running throughout the race. It was in this race that *Nancy* fouled *Jill*, and Olin Stephens withdrew, getting no points in the scoring.

The third race was sailed in a light, spotty breeze. It was made to order for *Viking*, and Trimingham kept his rivals safely covered, winning by one minute and seven seconds. *Nancy* did well and again got a second place, with *Bob Kat* third. The result of these three races gave *Viking* a safe lead so that all she had to do in the fourth affair, which was sailed in a strong southerly of some 21 miles' strength, was to finish without being disqualified. So Eldon Trimingham cannily played it safe, keeping out of mix-ups and finishing last. She sailed with a single reef down while the American boats carried full sail and intermediate jibs or working jibs. The American skippers covered their rivals carefully in this race and *Bob Kat*, getting away to a fine start, was master of the situation and slowly but steadily worked into a safe lead on the wind, which she maintained on the run to leeward, although *Nancy*, using a parachute spinnaker, closed on her a bit down wind. The second beat to windward found Bob Meyer sailing his boat hard and he passed the weather mark with a safe lead. Unfortunately, the next marker of the triangle had gone adrift, so that *Bob Kat* lost considerable time looking for it, while the two yachts behind rounded a regular buoy which was in approximately the same position. This put *Bob Kat* back in third position, but all the skippers in the race requested that the yacht in the lead at the weather mark on the second lap should be considered the winner. The race committee agreed and the race was thus won by *Bob Kat*. *Jill* was second and *Nancy* third.



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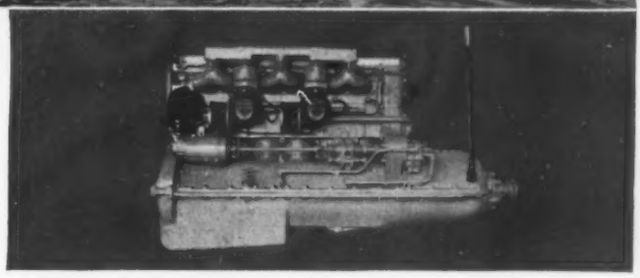
The "Billie M." built by the Dawn Boat Works of Clason Point, New York, for Mrs. E. M. Mandeville of Boston, Massachusetts. Length, 48' . . . beam, 11' 6" . . . draft, 3' 6".



Twin Hall-Scott INVADERS drive this 48′ Dawn at 27.2 m.p.h.

A smart, fast motor yacht, this Dawn—with its trim lines and stanch, seaworthy hull—powered with twin Hall-Scott INVADERS.

Built by the Dawn Boat Works for Mrs. E. M. Mandeville, the "Billie M." flies the burgee of the Boston Yacht Club and will be used for cruising in the waters of Nantucket Sound. Designed for comfortable living aboard, luxuriously appointed, the "Billie M." can, with equal flexibility and grace, poke about among the quiet harbors of the old clipper days, or show a clean pair of heels to other craft in open water.

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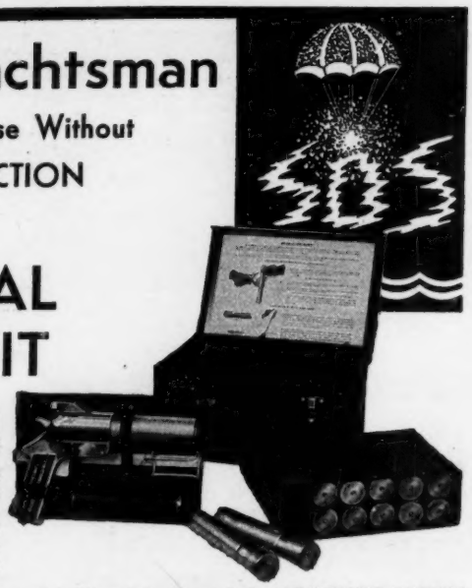

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Tippecanoe City, Ohio

"Griffin" Hunting on the Great Lakes

(Continued from page 58)

road. The wood and iron of the wreck jingled in the bag, first on one side and then on the other, as we changed shoulders or spelled each other in carrying back the "evidence." It was as though they were arguing, thus:

For the "Griffin":

Great age of the wreck, and no other known explanation for it. Skulls and skeletons. Hand-hammered chain. Silver watch. Handwrought washers. Curious lead filling of planking and unexplained lead sinkers.

Against the "Griffin":

Great size of the timbers, and not the slightest trace of axe-work or adze-work on them. Abundance and size of the ironwork. Absence of treenail fastening.

It was long past midnight before we found *Glencairn* quietly rubbing her fenders against the string piece of an island wharf, deposited our junk, and crept into our berths. There remained one clue to investigate, and that was the character of the metal. To determine that would take some time.

Mr. G. H. Turner of Little Current, Manitoulin, and his good wife, speeded up this phase by letting us see the report of an analysis of the tough iron from the wreck made by C. E. Plummer, technical director of chemical and metallurgical engineering for the Robert W. Hunt Co. of Chicago, a report and analysis since confirmed by the government of the Dominion of Canada at Ottawa, with corroboration from Paris.

The analysis showed: Carbon 0.41, manganese 0.020; phosphorus 0.040; sulphur 0.003; silicon 0.064 — which left me, for one of many, none the wiser. But the report went on:

> "This analysis does not correspond to iron or steel as manufactured at the present time. * * *
>
> "The mixture of high and low carbon materials, which show as fibrous and steely fractures on the cross section, together with the apparent presence of large amounts of iron oxide, lead us to believe that this bar was made by a process that was in use in northern Europe in the 17th century . . . could possibly have been made from Swedish iron by a process similar to that used in the early part of the 17th century."

This, corroborated by Ottawa and Paris, seems rather strong evidence on behalf of French or Swedish iron brought out by La Salle before 1678. But Herrick Duggan, whose steel work in bridges spans the North American continent, said the same report might be made of most of the mild tough iron used in the shipyards of Canada up to the middle of the last century. My own nickel's worth of observation is that the iron work of this wreck was heavier and not more decayed than the iron work of half a dozen wrecks of the period of the War of 1812 which I have examined — the *Niagara*, Perry's flagship; the *Scorpion* and *Porcupine*, of his fleet; the *Jefferson*, of Chauncey's; or the *Nancy*, *Tecumseh*, *Naawash*, etc., in the British fleet. Perhaps not as much.

Where, then, was the *Griffin* lost?

I don't know. Perhaps on Manitoulin Island. Perhaps quite near her "home port," if her launching place on the Niagara River might be called that. In the year 1805, after a heavy gale, a beautiful anchor was found where the sand and gravel had been washed from the beach of Lake Erie at Hamburg, Pa., which is about opposite the inlet of the Niagara River, and not far from Buffalo. A few years later, some time before 1813, on the Ingersoll farm, in Hamburg, was found a quantity of wrought iron, seven or eight hundredweight,

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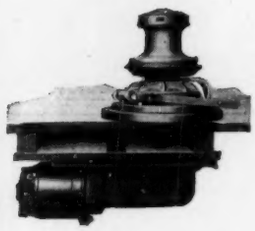

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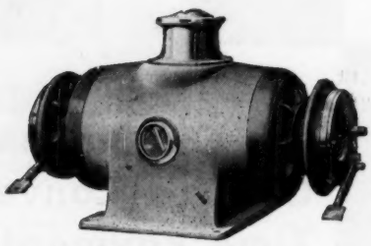

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supposed to have belonged to a vessel. Trees twelve inches in diameter had grown over it. In 1821, on the beach near this find, two cannon barrels were discovered. Their horns or trunnions were knocked off. Lettering on them was deciphered as French by James W. Peters, who left a record of the occurrence.

French guns, and a quantity of ship iron. The *Griffin* known to have been armed with French cannon and to be carefully hoarding a supply of iron for the building of a second ship, with which La Salle intended to descend the Mississippi. No other French ship, armed or otherwise, was lost on Lake Erie, so far as is known, either before the conquest of Canada, or since. The chain of evidence of the *Griffin* being lost within sight almost of her Niagara destination seems to be fairly complete; or at least as good a guess as the Manitoulin assumption.

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The Skipjack

(*Continued from page 69*)

aft. The keel is in two parts, a keelson and a shoe. There is no rabbet cut in the keel; the top of the shoe and under side of the keelson are beveled, as shown in the sketch of the midsection. The transom is well kneed to the keelson and to the sides. The stem and forefoot are constructed in the same manner as was done in the old Nonpareil sharpie. The keelson and shoe are let into the solid block of timber, forming the forefoot from below; the stem is notched into the fore end. The forefoot, made up of one or more balks of timber bolted together, is hewn to the required shape and fastened to the chine logs. In some boats the stem is rabbeted, in others an apron is used; the knight-heads serve to secure the fore end of the side strakes, and the sheer battens and the chine logs are let into them. The bitt, and often the mast, are stepped into the forefoot timber. The sketch of the stem shows the common construction used in the forefoot.

The Chesapeake skipjacks are of heavy scantling. Yellow pine is generally employed in their construction. The workmanship is rough but strong; the skipjack shows to good advantage when compared with most small fishing and commercial craft.

Two-masted skipjacks, built on bugeye proportions and rig, are successful on the Bay; some are double-ended. Skipjack schooners are sometimes seen in southern waters, but have never been very popular.

Two examples of yacht skipjacks have been worked out to see what was possible in a small boat. The typical rig was adhered to, as it seems to answer the requirements of the boats. Fig. 2 shows a design following very closely the original type, the freeboard being slightly increased and a long house employed, having a maximum headroom of about 4 feet 9 inches. A shorter trunk would look better, but room would be sacrificed below. The centerboard case is an obstruction in the cabin that is hard to overcome in this type.

Fig. 3 is a modified design, with a little curvature worked into the sections forward and into the stem. This boat, while lacking in headroom, would make a useful single-hander and week-end cruiser. The possibilities are far from being exhausted; some very interesting designs could be worked out around the original idea.

The type just described is a highly useful one for shoal waters, if more room is necessary than is obtainable in a sharpie. The cost will be greater than that of a sharpie of the same length, but less than that of a round-bottom sailing yacht of the same dimensions. Of course, it is possible to make the skipjack very expensive by unnecessary structural "improvements." Too little attention has been given the cost and necessity of many constructural fads favored in yachts, which is one of the reasons for their high cost.

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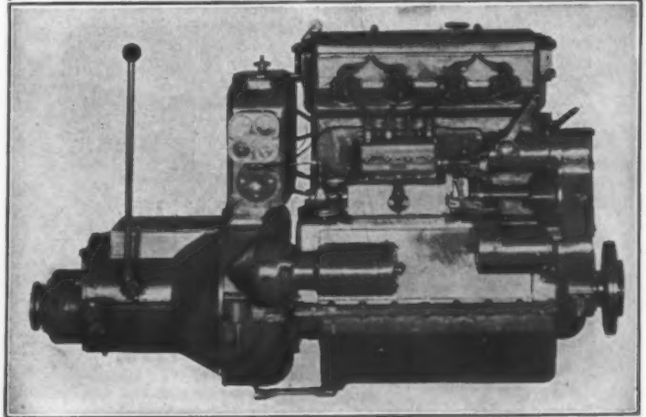

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48 H.P.

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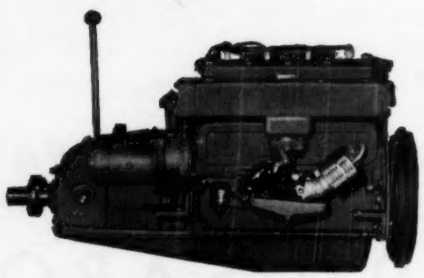
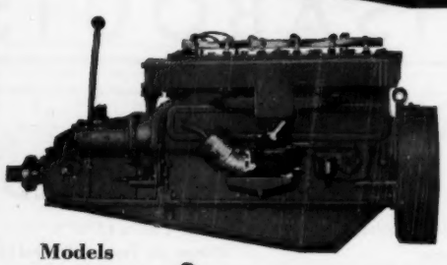
56 H.P.





Model HM-260-R
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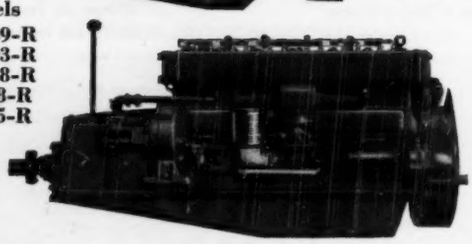
70 H.P.

Model HM-298-R
6 cylinders
81 H.P.

Models
KM-369-R
KM-393-R
KM-428-R
LM-468-R
LM-525-R



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Diesel Engines For the Small Cruiser?

(*Continued from page 49*)

increased depreciation charge on the more expensive motor. This is a matter of simple arithmetic which any owner can work out to his own satisfaction, basing his figures on the actual prices of the motors which he considers using, the actual prices of the two fuels in his locality, and the saving in insurance due to the use of oil. As soon as the hours of use per season increase, then the reduced fuel cost becomes more important. Any commercial job which is used around a thousand hours a year will effect a big saving in yearly costs when the Diesel motor is used, for then the fuel saving is great enough to compensate for the additional investment.

But the reduction in fuel consumption does give the owner of a small cruiser a real advantage. With a given amount of tankage, the Diesel-engined boat can cruise farther without refilling the tanks than if using gasoline. In some cases this is a controlling factor which will determine the selection of the power plant, while in others it is of secondary importance. Each owner must choose what he should do according to his needs.

With regard to reliability, there is little to be said in behalf of either as opposed to the other. Today the small Diesel has been developed to the point where it is fully as reliable as the gasoline motor. But should trouble develop, it is somewhat more difficult to find mechanics competent to diagnose Diesel engine ills and correct them than it is to find mechanics who can make a gasoline engine sit up and talk. Every little out-of-the-way harbor has several clever motor repairmen, but few have Diesel experts.

An owner who wishes to install a Diesel engine in his small cruiser — and by "small cruiser" is meant the boat from forty-five to sixty feet in length — can do it today with all confidence that he will have a most satisfactory power plant, provided he does not expect it to do a lot of impossible things, and provided he chooses one which has had the test of service and the advantage of a number of years of true and sane engineering development.

\+ + +

Heaving to

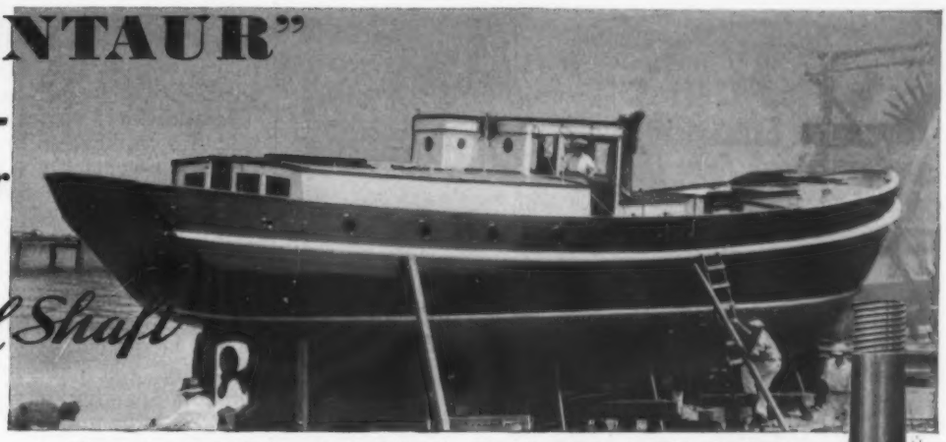
(*Continued from page 54*)

comfortable than by the bow, so the anchor was reset over the bow. However, it does not follow that anchoring stern first is not advisable. For other boats it might prove the best method and well worth giving a trial if a boat will not behave when anchored by the bow. Double-enders, in particular, can heave to by the stern. I have already mentioned that the trysail was too small and too baggy. The sea anchor was helpful until it collapsed, and then we learned about sea anchors. The sea anchor materially helped to keep her bow up and she lay properly about five or six points from the wind. With a good sea anchor I believe a modern cutter or sloop should lie in the same position and all the difficulties of heaving to under sail alone would be erased. A sloop might use a small trysail as a riding sail to steady the boat, which was the principal use *Carlsark's* poor trysail served. But the sea anchor must be adequate.

Guided by what we had read on the subject, we had made a good conical canvas anchor of the specified proportions — about one-tenth the l.w.l. in diameter at the large end, and, in length, one and one-third the diameter — but somewhere in a book we had seen two wooden cross beams used to hold open the mouth of the conical anchor. The wooden cross pieces were the ruin of that anchor's usefulness. They were lashed to the roped rim of the anchor, but due to the terrific strain and twisting of the anchor, the lashings parted and the

THE "CENTAUR"

a husky sea-going cruiser with a Monel Metal Shaft



"Centaur"—a husky 65-ft. cruiser built for Mr. Glenn Stewart by the Gibbs Gas Engine Company, Jacksonville, Fla., from designs by John G. Hanna, Dunedin, Fla. The power plant is a 150 H.P. Winton Diesel, driving through a 2¾ in. x 11 ft. Monel Metal Shaft in Goodrich Cutless Rubber Bearings.

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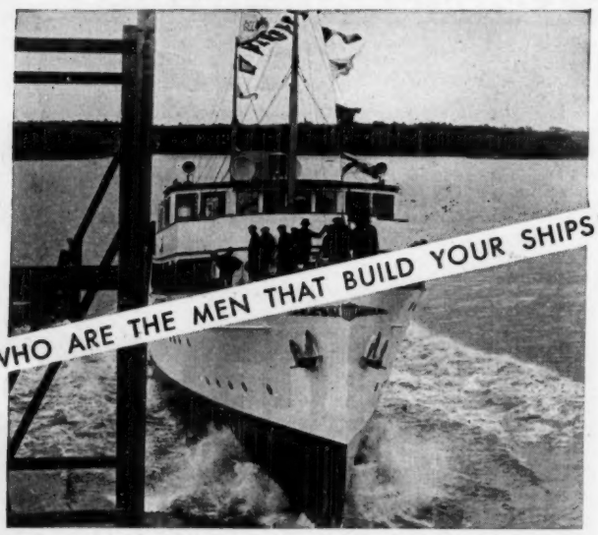

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canvas cone collapsed. The second fault of these wooden spreaders was that they tended to float the anchor and it was necessary to add a weight to keep it under the surface. The deeper the anchor is submerged, the better. The additional gear needed to secure the weight was an added complication and fouled the cable. Simplicity is the first essential of a sea anchor.

When *Carlsark* reached Gibraltar, the wooden crossarms were discarded and I had a Spanish blacksmith make a ring, slightly smaller in diameter than the mouth of the anchor, out of galvanized iron pipe. Two lengths of pipe were bent into semicircles and the four ends were threaded, so that the two semicircular sections could be joined with two ordinary plumber's unions. The ring was made in two sections so that it could be broken down for stowing. The ring was laced around the roping at the mouth of the sea anchor and thus the submerging weight was equally distributed and not concentrated at one point, as it was with the wooden spreaders. After this alteration we had no trouble with the sea anchor.

So far, only the conventional sea anchor has been considered. George Bonnell has tried a method of his own, which may supersede the large single sea anchor. He uses a long cable, into which are spliced ten or more shorter cables at equal intervals along its length. On the ends of these branch cables he fastens small sea anchors, such as are procured in marine hardware stores. The advantages of this method are numerous. You can attach as many of the little drogues as conditions demand, or as the characteristics of the boat require, whereas the single drogue may prove too large or too small. The little drogues are small, may be nested together, and easily stowed. Handling a large sea anchor on the gyrating foredeck of a boat in an approaching gale is difficult and dangerous work, but with the small drogues, which can be handled one at a time, the task is much simpler. A small iron anchor on the extremity of the cable will serve to submerge the string of little drogues. George Bonnell asks no royalty on this idea, so why not use it?

There is one more method of anchoring at sea, which is not the best, but which will serve in an emergency when a boat is caught offshore without a sea anchor. An ordinary anchor with cable or chain may be hove, and it will not hang straight up and down. It will curve downward, well ahead of the bow, and the resistance of the anchor and cable will assist surprisingly in holding up the bow.

At best, however, anchoring at sea is troublesome and hard work, and if the ship will lie comfortably under trysail, then keep the sea anchor stowed, but always have one aboard, since one never knows when it may be needed, especially if there is a shore to leeward. Above all other rigs, sloops and cutters should be well equipped with sea anchoring gear, for I am doubtful if many modern cruisers of these rigs can be handled with sail alone.

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International Dinghies—So Called?

(*Continued from page 74*)

advances made and standing now in the front rank of small boat racing.

I realize that Mr. Barnes was using the term "International" as applying to boats of all sorts and rig, probably, wherever found, but to us, as I have said, it has been used only to designate boats that challenge for or defend in contests with other countries. There is no recognized class of international 14-foot racing dinghies in America — there is in British waters. I understand the matter is to come before the Canadian Yachting Association and the North American Yacht Racing Union for action. This seems to me imperative.

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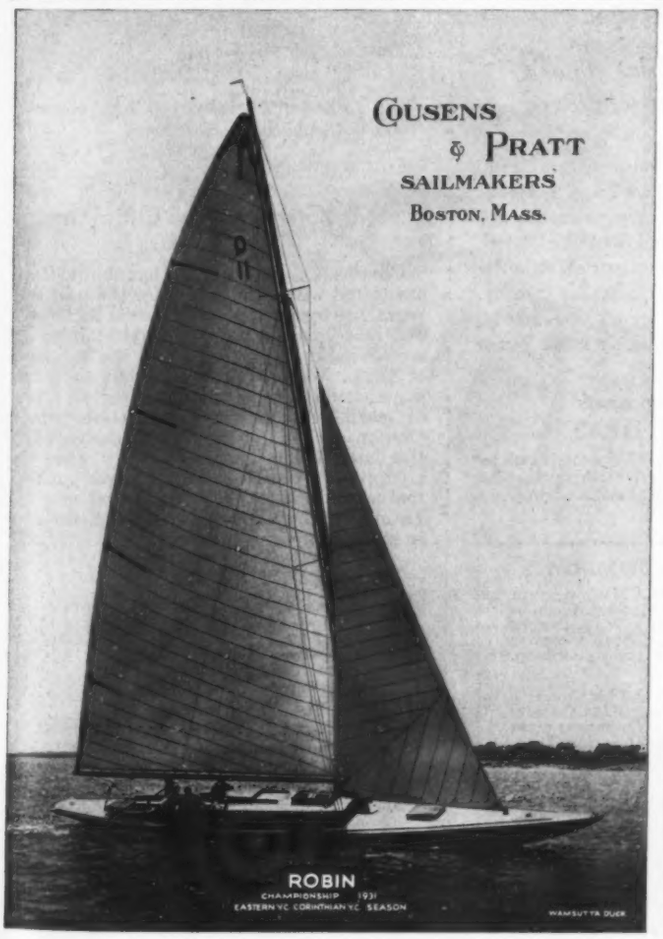
WHEELER PLAYMATES



COUSENS & PRATT
SAILMAKERS
BOSTON, MASS.

Thrills Aplenty

BUT FIRE WON'T BE ONE OF THEM

RIDING an aqua-plane at 30 miles an hour. What fun! What a thrill! A serious thing for both rider and those aboard if fire should suddenly flare up.

It can't happen on a LUX protected boat. For LUX kills fire in 3 seconds—even the most severe oil or gasoline blaze. LUX gas, piped to the engine space and bilge and discharged through patented Shielded Nozzles, smothers the flames by displacing the oxygen.

LUX is the accepted fire protection of over 3000 yachtsmen—also the U. S. Navy, Coast Guard, Fish Boats, Cargo Ships and Ocean Liners.

LUX

LUX systems are available from $40 up. Write for your free copy of "Cruising Without Fears", explaining details of the LUX System.

Walter Kidde & Company, Inc., 140 Cedar St., New York

Faces that laugh at weather

are shaved with

Barbasol

SHAVE WITHOUT LATHER

It takes a cream *to keep the face soft, smooth, pliable. That's why* Barbasol *prevents dry, harsh skin, chapping and windburn*

IT'S the sun and breeze and dust these days that dry and roughen the skin.

No wonder, then, Barbasol is the favorite with men accustomed to being out of doors. They know what a blessing it is to *shave without lather.*

Go ahead, try Barbasol yourself. Granted, you may miss that soapy lather at first. But if you treat your face to an entire tube, you'll banish tender skin and be sold for good on Barbasol.

That's because Barbasol is a *cream*—soothing, cooling, healing—100% free from the bite of soapy alkalis.

It softens whiskers instantly. Its creamy substance makes them stand up straight to take a clean-cut trimming.

No pull, no scrape. The natural oils held in. The skin left soft and pliable, protected from wind and sunburn. Barbasol makes it hard to believe a razor passed that way.

Now use Barbasol right. Follow these directions, and follow the millions of men who have made it the world's fastest-selling cream.

1. Wet your face and leave it wet. **2.** Spread on Barbasol. (No need for a vigorous rub-in.) **3.** Wet a good blade—and SHAVE.

That's all there is to the finest shave in the world. It's simple, easy, quick. Try it today. Generous tubes at all druggists', 35¢ and 65¢, or large jar, 75¢, will quickly make you a Barbasol Believer, too.

Barbasol recommends

TEFRA TOOTHPASTE

In every 30¢ tube there is a free Tefra toothbrush refill, to fit a lifetime Tefra refillable toothbrush handle. For full information, tune in Barbasol radio programs listed below.

BARBASOL RADIO BROADCASTS

Singin' Sam, the Barbasol Man, in songs you can't forget. Every Monday, Wednesday and Friday evening, at 8:15, Eastern Daylight Saving Time, over an extensive Columbia (WABC) Broadcasting hook-up.

●

The Old Singin' Master and his singers—mellow old hymns and ballads the way you like them. Tune in every Sunday night at 10:15, Eastern Daylight Saving Time, on the N. B. C. (WJZ) Blue Network, coast to coast.

●

Ray Perkins, Barbasoloist and Peter Van Steeden's Barbasolians, WEAF—N. B. C. Red Network, Tuesdays and Thursdays, 7:30 P. M. Eastern Daylight Saving Time.

Consult radio page of your local newspaper for stations

Mower Opens New Office

(*Continued from page 95*)

The largest sailing yacht building at the present time is the 92-foot over all cruising schooner designed by Mr. Mower for Roger Young, Esq., at the yard of M. M. Davis & Son, Solomons, Maryland.

Mr. Mower's other recent designs include the 120-foot Diesel powered yacht *Analgra,* owned by Lewis E. Pierson, Esq.; *Windward,* Class M sloop, for Junius S. Morgan, Esq.; *Novia,* 56-foot express cruiser owned by Vice-Commodore Harold Tobey of the Larchmont Y. C.; the cruising schooners *Quicksilver II* and *Shellback,* and the Eight-Metre sloops *Mab* and *Sally.*

Among the successful one-design classes which Mr. Mower has designed are the Sound Interclubs, the Vineyard "Eighteens," and the Katama Class.

\+ + +

New Wilcox-Crittenden Catalog

Many new items of interest are included in the Wilcox-Crittenden Marine Hardware Catalog — the most recent edition of which has just been released. New and improved fittings are represented in the line of Hurricane Tested marine lights, the line of lavatory equipment, outboard fittings and dependable marine hardware. A copy of this new catalog may be had by writing to the manufacturers, Wilcox, Crittenden & Co., Inc., So. Main Street, Middletown, Conn.

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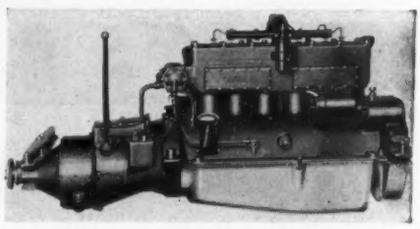

An Imperial Chrysler 106 h.p. motor with reduction gear

\+ + +

MacGregor Opens Office in East Lynn

Charles G. MacGregor, naval architect associated with John Alden for the past ten years, has opened his own office at 22 Huron St., East Lynn, Mass. His early training in naval architecture was under the tutelage of G. L. Watson and since that time his experience has broadened to cover all types of marine design and construction. MacGregor was the first flying boat designer for the late Glenn Curtis. His new office is equipped to design sail and power yachts, motor boats and small commercial vessels. Estimates and supervision of such designs in wood, composite and steel will be handled.

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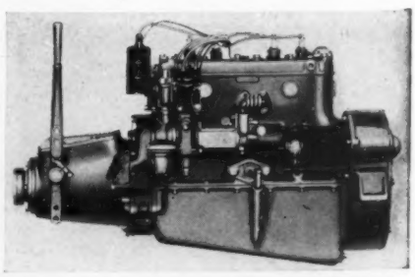

The compact 25 h.p. Farr motor, ideal for auxiliaries

REDUCE
YOUR YACHT INSURANCE COSTS

For ninety years, large shipowners have protected themselves against loss or damage by insuring with the Atlantic Mutual Insurance Company, thereby effecting substantial savings, as dividends of profit are paid to policyholders instead of stockholders.

Now it is possible for yacht owners to economize in precisely the same way. The Company has insured property to the value of over 41 Billion Dollars, has returned dividends to policyholders of over 115 Million Dollars, and its reputation, financial strength and record of settlement are internationally known.

(Latest Dividend to policyholders 15%)

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For your protection the law requires that you carry certain Equipment.

Our stock includes everything required by government regulations and your own standards of comfort and safety.

W. & J. TIEBOUT
NEW YORK
118-120 CHAMBERS ST.

EVERY can of "Toxicop" the new Woolsey, Copper-Plus, Wood Bottom Paint bears a written guarantee. This guarantee states that "Toxicop" will keep your boat bottom free of barnacles, sea growths and teredo worms for at least 6 months or Woolsey will provide, free, enough paint to repaint the bottom. That is your assurance that "Toxicop" is the *perfect* wood bottom paint.

Write for complete details today

C. A. Woolsey Paint & Color Co.
Established 1853
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Makers of Copper BEST Paint — Copper Yacht Paint — Yacht White — Deck Enamel — Engine Enamel — Caw-Spar Bakelite Varnish — Tungspar Varnish — Boottopping Paints — Canoe and Rowboat Paints — Seam Compounds — Every Marine Paint Need.

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French Ensemble: Pastel Sports Hat; Dress of "Sennelic," Jacket of Broderie de Laine.

At the Finish of The Ocean Yacht Race

"Make your expenses"—profit by the depreciated pound and Bermuda's low import duties—exemplified in our amazing values in smart European attire, including correct yachting and sports wear. Finest quality and workmanship—since 1889.

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Five Stores and Gift Shops in **BERMUDA**

This Marine Glass magnifies 10 times. Sealed against dust and moisture. $110. Catalog of 32 pages sent free on request.

"Who has the right of way?"

Excitement! Half a mile away, but what of it? Your Bausch & Lomb Marine Glass brings it to less than 90 yards. Great for night and dirty weather, too. Ask your dealer to show you this optical marvel.

Bausch & Lomb Optical Co., 722 St. Paul St., Rochester, N.Y.

BAUSCH & LOMB
BINOCULARS

A Small Single-Handed Cruiser

(*Continued from page 78*)

empty itself quickly. I have shown a hatch forward over the top locker, one over the forward part of the cabin, one in the cockpit to give access to the motor's clutch, the stuffing box and storage space below the cockpit, a hatch in the bridge deck for outside filling of the ice box, a hatch in the after deck to utilize the space abaft the cockpit. These hatches are very convenient and help ventilate the interior of the boat. One need not worry about their leaking. If they have high coamings, and if they are properly made and fitted with suitable gaskets, they can be fastened down watertight.

Now comes the disagreeable consideration, in these days, the *Cost!* One should not overlook the fact that prices are extremely low just now and I doubt if there will be for years an opportunity to have built a good boat at as low a price as at present. Prices will vary considerably with the builder selected, the locality, workmanship desired, the specifications used, and the equipment. I would estimate that a boat based on this design could be built somewhere within the following variation:

The hull, complete, including ballast, hardware, blocks, spars, rigging, deck joinerwork, cabin interior and joinerwork, tanks, plumbing, piping, painting, material and labor of installing a motor, anchors and cables, stove, electric lights and wiring, and the required government equipment, between $2,300.00 and $3,300.00. The lower price would be for a very plain craft, strongly built, but cheap, and this might be shaded a little by using the cheapest of materials and the simplest of joinerwork, omitting the installation of the motor and perhaps with the owner doing some of the simpler work and painting himself. The higher limit would, of course, give a first-class job, although there are a few of the really fine boat builders that might want a little more.

Sails and covers can be obtained from $130.00 to $250.00, depending upon what is used, the ordinary cheap commercial duck or the best of American or Egyptian cotton, and the sail maker selected.

A motor can be bought that will range from $150.00 to $375.00 depending on the make and power, or a small second-hand rebuilt one could possibly be bought for less.

Compass, from $20.00 to $50.00, depending on the size, make and type, possibly less.

Upholstery, from $40.00 to $125.00, depending on the cabin plan, quality and quantity desired.

Electric battery, from $10.00 to $25.00, depending on the capacity, quality, type and make. Some cheap ones can be bought for less but they will not last long and have little capacity for electric lighting.

This would make the boat cost, complete, and ready to use, somewhere between $2,650.00 and $4,125.00, and even this can be reduced or enlarged depending on the desires of the individual.

Of course, a tender will have to be purchased, if the builder does not already possess one. Bedding, dishes, silverware and cooking utensils can probably be borrowed from the home. Charts, navigation equipment, barometer, log, pilot books, tide books, and the miscellaneous other items that go to equip the boat are probably already possessed, as the cruising yachtsman is always accumulating these things and seldom sells them if he has previously had a boat, as they are generally considered personal belongings.

I know of no other expenses except insurance, which is not high considering the protection it gives, and (I shudder) a fee for the architect for preparing the building plans and specifications and supervising the construction.

Outboarding in Winter

You cannot run an ordinary outboard boat in the winter time, but you can run an outboard ice boat.

Realizing that power ice boating is a sport that compares favorably with outboard boating, the officials of Outboard Motors Corporation, Milwaukee, have promoted the construction of a power ice boat, plans for which may be secured at a very low cost.

Briefly, this power ice boat consists of a hull mounted on three runners, an outboard power head and a 52-inch air propeller.

In tests this outfit has attained speeds ranging between 50 and 60 miles per hour. Driving is fully as thrilling as outboard racing. It is anticipated that within a few years power ice boat racing will attain some of the popularity which is now credited to outboard racing.

+ + +

Lycoming Announces New Model

To meet the demand for a small 4-cylinder marine engine for medium duty service, Lycoming Manufacturing Company has recently designed Model UAC. This engine develops 35 horsepower at 2600 r.p.m. The bore and stroke are respectively 3⅛" x 3 ⅞", giving a piston displacement of 119 cu. in. Special low compression cylinder head eliminates detonation at full throttle under heavy load, while an extra heavy flywheel smooths out the torque variations.

Electrical equipment consists of 6-volt Auto-Lite belt driven generator, flange mounted starter with Bendix engagement, and 6-volt high tension distributor with automatic spark advance. Schebler plain tube carburetor fitted with A. C. flame arrestor and A. C. diaphragm type fuel pump are included in the fuel system.

Lubrication is by pressure to all main, connecting rod and camshaft bearings. An oil cooler is included as regular equipment and is provided with automatic pressure release to avoid damage to the cooler tubes if the oil pressure should be excessive. A similar valve maintains constant oil pressure to the bearings.

Model UAC Lycoming engine is especially designed for use in small cruisers, work boats and auxiliaries, where uniformly high torque is required at moderate engine speed.

+ + +

Scripps Service Parts

The Scripps Motor Company announces the issuance of a new Parts Price List.

Because a marked reduction in the list price of service parts has been made, this booklet should prove of particular interest to Scripps owners who are at this time overhauling their motors in preparation for the coming boating season.

One of these lists will be forwarded promptly on receipt of the owner's name and address and the serial number of his motor. Address the Scripps Motor Company, 5833 Lincoln Avenue, Detroit, Michigan.

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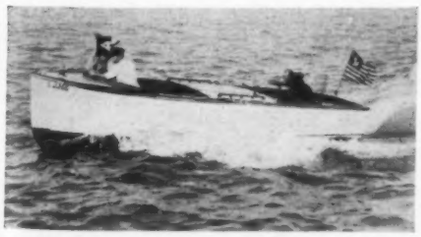
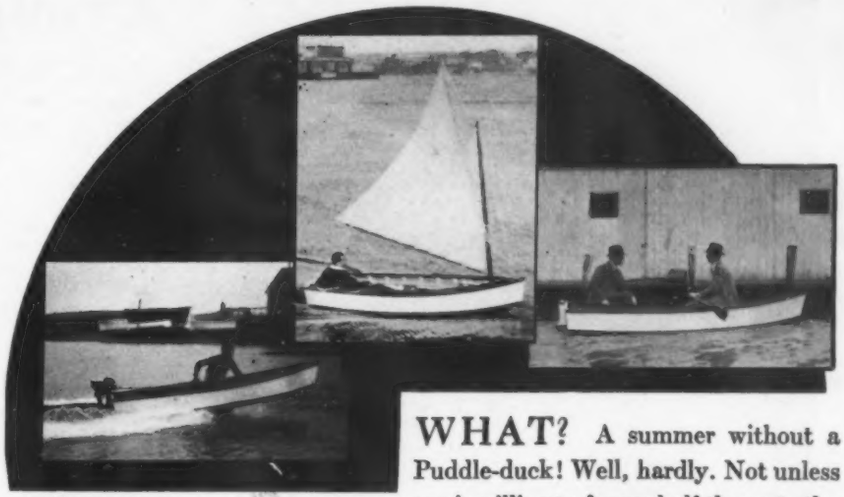


"Scram," owned by John Wanamaker, is powered with a Universal Six-77



the Smart thing this year

WHAT? A summer without a Puddle-duck! Well, hardly. Not unless one is willing to forego half the zest, the thrill, the pleasure of one's vacation. The Puddle-duck is the smart thing this season. It earned its popularity through numerous victories in nationally prominent regattas. Now, it holds an important place at so many exclusive resorts.

You'll enjoy the Puddle-duck for its all-around usefulness. Drive it. Sail it. Row it. Speedy enough for racing. Safe enough for a child. Reasonable enough in price for any pocketbook. Durable, dependable, and offering more exclusive features than any boat in its class, at any price.

Write for illustrated literature, containing full specifications. No obligation.

FEATURES

SAFE FAST

Length 11' 3". Beam 60". Draft with board up, 6½" (with board down, 28"). Weight, including equipment and spars, 280 lbs. Frames, seat and flooring of spruce. Planking of white cedar. Decks and varnish trim in mahogany. Center board of Washington cedar. Spars, fir. Hardware of cast brass. Galvanized air tanks painted. Metal rudder. Wooden tiller handle. Type of rig, spritsail. Price includes oars, sails, spars, brass oarlocks and hardware, life lines, etc., all complete ready for sailing.

PUDDLE DUCK

Product of the Dauntless Shipyards, Inc. Essex, Connecticut

DEALERS

Write at once for details concerning our unusual Agency offer.

$134 75 F.O.B. ESSEX CONNECTICUT

BURROWS PARACHUTE SPINNAKER

...the most efficient pulling light sail ever developed...proved the outstanding feature of winning yachts at the Mid-winter Regatta recently held at Los Angeles, Cal.

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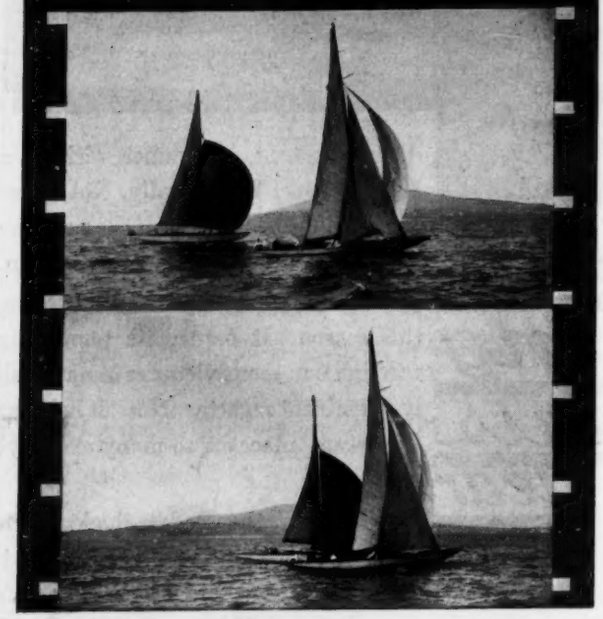

A TOUGH LITTLE TENDER

ROUGH, hard use is no torture for an Old Town Dinghy. She will tow, or stow on board, and always be ready for instant use. Solid, wood construction covered with canvas can't leak. She'll stand any amount of exposure and never crack open . . . never need calking or soaking. The stern is built and braced to take a kicker. She's roomy and rugged.

Write for a free catalog showing models. Also illustrates outboard boats including big, all-wood, seaworthy types for family use. Rowboats and canoes. Write today. Old Town Canoe Company, 396 Main Street, Old Town, Maine.

★ "Old Town Boats" ★

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Reduced Prices

SAILING TENDERS
10 Ft. $125 12 Ft. $1.
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Approximate Speed 14 miles
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133 Riverside Ave.
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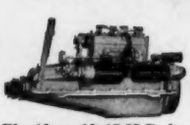
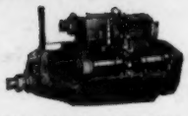
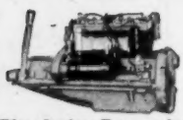
Write for Catalogs



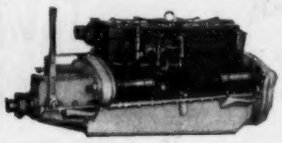
Flexifour 10-15 H.P. for tenders, fishing boats, small cruisers, auxiliaries, launches and runabouts. Reduction Drive Models. Low priced.



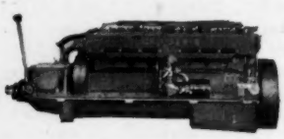
New Flexifour 25 H.P. for small cruisers, fishing and work boats, auxiliaries, runabouts and launches. Finest motor in its class. Low priced. Reduction Drive Models.



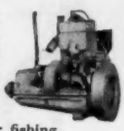
Blue Jacket Four — for fast runabouts and 125 Cu. In. racing class. 4000 R.P.M. Has the smoothness of an Eight with the compactness and economy of a Four.



New Blue Jacket Six — Duplicate design of Four; 148 Cu. In. 4000 R.P.M. 70 H.P.; for fast runabouts. Also low and medium speed 40 H.P. model for Cruisers with direct or built-in Reduction Drive.

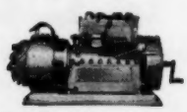


New Cruiser Six and Eight — 260 Cu. In. 60 H.P. Six and 347 Cu. In. 80 H.P. Eight designed for large propellers at low and medium R.P.M. Also high speed 88 H.P. Six and 115 H.P. Eight. True twins for twin screw installations and Universal Built-in Silent Reduction Drive models.



Single 6 to 8 H.P. for fishing and work boats and auxiliaries. Direct or Reduction Drive.

Write for complete information
UNIVERSAL MOTOR COMPANY
312 Universal Drive
Oshkosh, Wisconsin, U. S. A.



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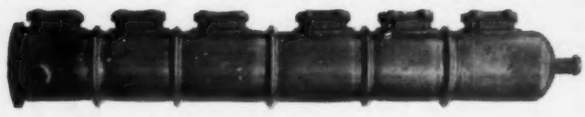

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also copper repair work of all kinds
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